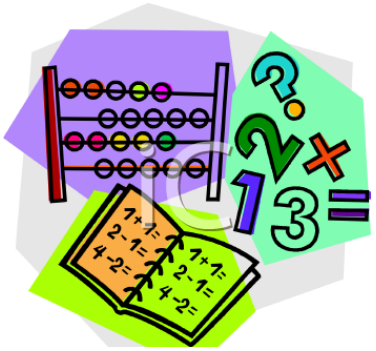
FSTU 3913 Nursing Maths



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Pukamahi Tuatahi

(Workbook One)

Tātaitanga

(Calculations)

Ingoa: _____

My Tutor: .....

Office: .....

Phone: ....

Email: .....@unitec.ac.nz

My Class times:

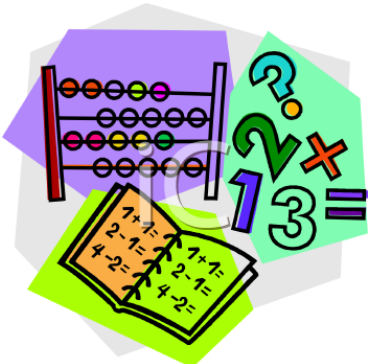
Day			
Room			
Time			

Need maths study help? - Drop in to see a Maths Learning Advisor or book an appointment book an appointment here: https://guides.unitec.ac.nz/labookings/numeracy

FSTU 3913 Nursing Maths
Weekly outline - assessment events and topic schedule semester 1 2022

Week	Date	Topic	Assessment event	
			Due date	Value
1	28 Feb-4 Mar	Introduction, diagnostics **TOPIC 1: CALCULATIONS & ESTIMATIONS:** Whole number calculations & strategies, rounding, multiplication, multiplication estimation, applications, dividing by numbers with zeros		
2	7-11 March	division estimation, algorithm, applications, **begin Assignment 1 (Language of prescriptions and drug labels) LNAAT,** integers, powers, order of operations	**Start Assignment 1 in class Lesson 2**	
3	14-18 March	Order of operations, decimals: place value, ordering, rounding, addition, subtraction, decimal multiplication, applications, division of decimals by whole numbers, **Course evaluation**	**Assignment 1 due:**	**5%**
4	21-25 March	Multiplication and division by powers of 10, division of decimals by decimals, estimation by rounding and dividing, applications **Topic 1 revision**	**Moodle Quiz 1 due:**	**1%**
5	28 March-1 April	**Topic Test 1** **TOPIC 2: MEASUREMENT, FRACTIONS, PERCENTAGES:** Metric units & conversions, reading scales, calculate time	**Test 1 Lesson 1 date:**	**20%**
6	4 Apr – 8 Apr	more conversions, reading scales practical tasks Fractions introduction, **Begin Assignment 2 (measurement tasks) in class** fractions - ordering and comparing, equivalent fractions, simplifying	**Moodle quiz 2 due: Start assignment 2**	**1%**
7	11 Apr – 14 Apr (Easter public holidays 15 Apr)	fraction operations -addition & subtraction, fractions of an amount, multiplication of fractions by whole numbers and by fractions	**Assignment 2 due:**	**5%**
Study Break April 19th – April 30th				
8	2 May – 6 May	Change fractions to decimals, decimals to fractions, understand percentages, and link to fractions and decimals, ordering fractions decimals percentages **Course evaluations**		
9	10 May – 14 May	More fractions decimals and percentages, calculate percentages 25%,10%, 5 % 1% etc, find percentage increase and decrease, writing a proportion as a percentage		
10	16 May – 20 May	Percentages applications**,** **Topic 2 revision,** **Topic 2 Test**	**Moodle Quiz 3 due:** **Test 2 Date:**	**1%** **25%**
11	23 May – 27 May	**TOPIC 3: TABLES GRAPHS AND STATISTICS** Intro to reading tables. Reading tables and graphs, Summary statistics		
12	30 May – 3 June	**Begin Assignment 3 (Graphs and Data) in class** **TOPIC 4 RATIOS & DRUG CALCULATIONS:** Tablet calculations ratios, sharing in a given ratio, find unknown quantity in a ratio	**Assignment 3 Start in class**	
13	7 Jun – 10 Jun (holiday 6 June)	drug calculations intro Oral Drug calculations mg/mL & dosages for injection, dosage applications,	**Assignment 3 due:**	**5%**
14	14 Jun – 18 Jun	doses by weight, divided doses**, Begin Assignment 4 (Nursing Applications) in class** Infusion rates basics, flow rates mL/hr, infusion rate changes, **LNAAT**	**Quiz 4 due** **Start Assignment 4**	**1%**
15	20 Jun – 23 Jun (holiday 24 Jun	Infusion rate flow rates in drops/min, understanding drop factor, & applications **Course evaluations**	**Quiz 5 due: Assign. 4 due:**	**1%** **5%**
16	27 Jun – 1 Jul	**Revision topic 4,** **Topic 4 test**	**Test 3 (Topic4) date:**	**30%**
17	4 Jul – 5 Jul	Resits if applicable		

Contents



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DIAGNOSTIC TEST – NUMBER

This test will find how well you can add, subtract, multiply and divide whole numbers and decimal numbers. It will show your tutor what you can already do in our first topic of work.
Do not use a calculator.
Write your answers on a separate piece of paper, **showing all your working**.
For each question, after your answer, write **C** if you are confident, **NS** if you are not sure.
If you have no idea how to attempt the answer, just write **NI** and go on to the next question.

Part A: Whole Numbers

1. Write in words 4,032,301

2. Write in numbers "two million, three hundred thousand and fifty - two"

3. $1427 + 74$

4. Add 60 mL of disinfectant and 25 mL of detergent to 2000 mL of water. What is the final volume?

5. $423 - 15$

6. $1000 - 46 - 23$

7. Calculate the amount of water which must be added to 85 mL of stock solution to make up the volume to 1200 mL.

8. 24×6

9. 62×851

10. $3625 \div 5$

11. $428 \div 4$

12. Round 23, 546 to the nearest thousand.

13. $-3 + 7$

14. 2^3

15. $12 - 2 \times 3$

Please continue with Part B over the page.

DIAGNOSTIC TEST – NUMBER

Part B: Decimal Numbers

1. $2000.4 + 46.01 + 0.003$

2. $128.43 - 47.6$

3. 2.2×6

4. 0.08×0.1

5. 4.3×100

6. 0.00258×1000

7. $20.5 \div 5$

8. $102 \div 4$

9. $8 \div 0.4$

10. Round 1.3333 to 2 decimal places

11. Round 9.599 to the nearest whole number

12. $0.6 \div 1000$

13. Which is larger? 0.9 or 0.71

14. Which is larger? 0.04 or 0.006

15. Write 7.2×10^{-3} as an ordinary number

WHOLE NUMBER PLACE VALUE

Millions House			Thousands House			Starter House		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones

Exercise 1

1. What is the **place value** of the 8 in the following numbers:

a) 2834
b) 14,825
c) 482,067,000
d) 895,700
e) 308,465
f) 306,985
g) 18,450,000
h) 46081
i) 864,302

2. What is the **value** of the underlined number

a) 3,45<u>6</u>
b) <u>6</u>00,731
c) <u>5</u>,741
d) <u>6</u>,874,153
e) 6<u>5</u>7,413
f) 3,<u>8</u>00,641
g) 7<u>8</u>1,235
h) <u>3</u>,845
i) <u>6</u>8,942

Exercise 2

Write these numbers in words or read them to a friend

	A	B
1	645	960
2	394	468
3	7310	9306
4	83,840	43,602
5	25,004	77,091
6	430,540	745,641
7	650,603	700,401
8	9,800,421	6,701,621
9	20,841,027	143,694,038

WHOLE NUMBER PLACE VALUE

Exercise 3

Write these as numbers:

A

1. Sixty four
2. Four hundred and fifty two
3. Six hundred and eight
4. Five hundred and forty
5. Two thousand four hundred and sixty five
6. Six thousand and seven
7. Eight thousand seven hundred and six
8. Twenty three thousand four hundred and eighty seven
9. Thirty five thousand and twenty nine
10. Three hundred and sixty five thousand, eight hundred and ninety two
11. Two hundred thousand and eight
12. Two million, three hundred and forty five thousand, six hundred and seventy nine
13. One million and ten
14. Thirteen million, two hundred and eighty five

B

1. Fifty two
2. One hundred and twenty
3. Two hundred and fifty nine
4. Nine hundred and eighty one
5. Three thousand eight hundred
6. Five thousand nine hundred and forty
7. Nine thousand and fifty six
8. Forty nine thousand seven hundred and eight
9. Sixty thousand six hundred and seven
10. Two hundred and seventy thousand, four hundred and sixty four
11. Three hundred and eighty seven thousand, nine hundred and two
12. Three million, sixty thousand and fifty four
13. Eight million, four hundred and twenty nine thousand, six hundred and one
14. Nine million and sixty seven

WHOLE NUMBER PLACE VALUE

Exercise 4 Write the number that is:

	A	B
1.	One more than ninety nine	Two more than 198
2.	Five more than 295	Ten more than 998
3.	Ten more than 1950	Fifty more than 850
4.	One hundred more than 995	One hundred more than 1950
5.	Two hundred more than 850	One less than 200
6.	Two less than 300	Ten less than 100
7.	Twenty less than 200	One hundred more than one thousand
8.	Ten thousand more than one hundred thousand	One thousand more than one hundred thousand
9.	One hundred more than ten thousand	One hundred more than one million
10.	One thousand less than eleven thousand	Ten thousand less than one hundred thousand
11.	Ten less than ten thousand	One hundred less than one million

WHOLE NUMBER ARITHMETIC

REVISION OF BASIC WHOLE NUMBER OPERATIONS

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Standard Algorithm – Addition

Example:	23 + 45 + 7 =	123 + 36 + 5 =
Set out in columns lining up the place values		
	23	123
	45	36
	+7	+ 5
Answer =	75	164

Exercise 5
Calculate the following:

	A	B	C
1	46 + 131 =	179 + 48 =	156 + 21 =
2	93 + 228 =	124 + 32 =	134 + 125 =
3	261 + 106 =	372 + 218 =	699 + 907 =
4	826 + 497	666 + 666 =	587 + 785 =
5	49 + 52 + 65 =	38 + 47 + 29 =	27 + 27 + 27 =
6	103 + 290 + 400 =	386 + 288 + 828 =	473 + 68 + 311 =
7	112 + 1049 + 8299 =	158 + 1187 + 169 =	4659 + 324 + 1543

8 Charles was really hungry after missing breakfast. At McDonalds he ate a Big Mac (540 calories), large French Fries (570 Calories), 2 packets of ketchup (10 calories each), and a chocolate triple thick shake (440 calories).
What is the total number of calories Charles consumed?

Standard Algorithm – Subtraction

Example: 29 – 14 = 64 – 26 = 152 – 65 =

Set out in columns, lining up the place values. Subtract, starting on the right (one's column). Remember, when we don't have enough we have to 'steal' or 'borrow' one from the column before.

	29	$^{5}\cancel{6}\,^{1}4$	$\cancel{1}\,^{14}\cancel{5}\,^{1}2$
	–14	–2 6	–6 5
Answer =	15	3 8	8 7

Exercise 6. Calculate the following: ***(Remember to check by adding up again!)***

	A	B	C
1	639 – 528 =	476 – 333 =	521 – 135 =
2	437 – 219 =	382 – 299 =	871 – 172 =
3	861 – 794 =	720 – 638 =	531 – 487 =
4	530 – 376 =	960 – 134 =	475 – 143 =
5	1073 – 296 =	8762 – 2164 =	4180 – 1948 =
6	8736 – 692 =	3080 – 1761 =	7173 – 6666 =

7 Hera had $62 to spend on food and drink at a music festival. On Friday she spent $25. How much did she still have for the rest of the weekend?

Standard Algorithm – Subtraction with zeros

Example: 2000 – 35 =

When we need to 'steal' or 'borrow' one, sometimes there is nothing in the next column. We have to keep looking further columns to the left until we find something to 'steal' or 'borrow'. Remember, one column at a time, take one and place it in the next column – 1 in one column is worth 10 in the next column. We can then steal (borrow) 1 from the 10 to make 9 in that column and 10 in the next.

$$\begin{array}{r} {}^{9}\ {}^{9} \\ {}^{1}\cancel{2}\,{}^{1}\cancel{0}\,{}^{1}\cancel{0}\,{}^{1}0 \\ -\ 3\ 5 \\ \hline 1\ 9\ 6\ 5 \end{array}$$

Answer =

Exercise 7. Watch the zeros!

	A	B	C
1	500 – 64	300 – 27	400 – 86
2	1000 – 465	3000 – 464	8000 – 538
3	3000 – 1644	4000 – 2495	7000 – 5325
4	20,000 – 3537	10,000 – 4924	50,000 – 22,456

5 When Melissa ate at McDonalds she bought a chicken salad and consumed just 330 calories. If the daily recommendation for women is 2000 calories, how much of her daily allowance remained?

WHOLE NUMBER ARITHMETIC

Keep subtracting!

Sometimes we need to subtract more than one number**.**
Example: A patient needs to drink 1600mL of fluid a day. So far, they have had 300mL orange juice, 250mL tea and 520mL water. How much more fluid do they need?

Method 1: We can write this problem mathematically as 1600 – 300 – 250 – 520. To solve, we need to subtract the numbers one at a time:

1600	$1^{2}\cancel{3}^{1}0\ 0$	1 0 5 0
–300	– 2 5 0	–5 2 0
1300	1 0 5 0	5 3 0

Answer = 530mL still needed

Method 2: Alternatively, we can first add together the amount drunk so far, and then subtract. We write this mathematically as 1600 – (300 + 250 + 520)

3 0 0	$1^{5}\cancel{6}^{1}0\ 0$
2 5 0	– 1 0 7 0
+ 5 2 0	5 3 0
1 0 7 0	

Answer = 530mL still needed

Exercise 8. Try these both ways!

	A	B	C
1	300 – 25 – 15 or 300 – (25 + 15)	1700 – 350 - 290 or 1700 – (350 + 290)	2100 – 25 – 260 or 2100 – (25 + 260)
2	1562 – 34 – 325	753 – 328 – 16	284 – 120 - 67
3	2000 – 325 – 37 – 640	4000- 1380 – 1400 – 280	1000 – 35 – 250 – 170
4	A water tank at a camping ground contained 3000 Litres of water. Over 3 days, the campers used the following: Day 1, 485 Litres. Day 2, 524 Litres. Day 3, 602 Litres. How much was still in the tank at the end of 3 days?		

Alternative Addition and Subtraction Strategies for Whole Numbers

There are lots of methods we can use to add, subtract, multiply or divide numbers. By having different methods, we can check our answers in a different way and be sure of not making the same error both times. Different people find different methods work best for them. Some methods are quicker for some problems and don't work so well for others. Practise all of these methods and decide what works for you. The aim is to get to the right answer quickly and accurately. Always try to use a different method to check where possible.

Partitioning

Example: 134 + 287

Break into place values:

134 + 287 = 100 + 200 + 30 + 80 + 4 + 7

= 300 + 110 + 11

= 421

OR set out as follows:

100 + 200 = 300

30 + 80 = 110

4 + 7 = 11

421

Exercise 9. Try these:

	A	B	C
1	134 + 253	542 + 381	872 + 946
2	382 + 274	282 + 786	142 + 590
3	445 + 686	368 + 194	662 + 632
4	2360 + 775	2537 + 259	7443 + 465

5 Two bottles containing morphine hydrochloride solution were combined. If the first bottle contained 283 mL, and the second bottle contained 415 mL, how much was the total amount of solution?

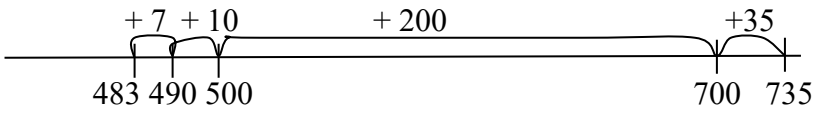
WHOLE NUMBER ARITHMETIC

Counting back up to find the difference

Subtractions can be done as an addition. This method can be done with or without a number line.

Example 735 – 483

Think of this as 483 + __?__ = 735



Starting from 483,

First add up to the next 10: 483 + **7** = 490

Then take up to the next hundred: 490 + **10** = 500

Add up to the last hundred: 500 + **200** = 700

Finally add up to 735: 700 + **35** = 735

Altogether we have added 7 + 10 + 200 + 35 = 7 + 245 = 252

So 483 + 252 = 735 meaning that 735 – 483 = 252

Exercise 10. Add up to get the answers:

	A	B	C
1	87 + ____ = 100	54 + ____ = 100	69 + ____ = 100
2	48 + ____ = 100	286 + ____ = 300	463 + ____ = 500
3	142 + ____ = 200	574 + ___ = 600	317 + ___ = 400
4	576 + ____ = 800	318 + ____ = 600	245 + ___ = 800
5	243 + ____ = 1000	358 + ____ = 900	818 + ____ = 1000
6	800 – 521 =	300 – 164 =	900 – 399 =
7	720 – 298 =	850 – 435 =	610 – 326 =
8	930 – 463 =	425 – 163 =	663 – 282 =
9	818 – 375 =	639 – 246 =	738 – 176 =
10	406 – 88 =	945 – 27 =	724 – 64 =

11 How much concentrate will need to be added to 295 mL of water to make up a solution of 430 mL?

Using Doubles Extension Work

Example: 356 + 352 = 350 + 350 + 6 + 2
= 700 + 6 + 2
= 768

173 + 168 = 170 + 170 + 3 – 2
= 340 + 3 – 2
= 341

Practice Drill 4 before doing this exercise.

Exercise 11. Try these:

	A	B	C
1	134 + 131	548 + 553	802 + 806
	294 + 305	202 + 198	142 + 137
3	245 + 242	253 + 251	156 + 151
4	1302 + 1299	2407 + 2398	7103 + 7102

5 Two bottles labelled 500 mL were found to contain 498 mL and 503 mL respectively. What was the total amount of fluid in the two bottles?

Rounding and Compensating

Example: 456 + 398
= 456 + 400 – 2
= 856 – 2 = 854

643 – 196
= 643 – 200 + 4 Note that here you took away too much so you have to add it back.
= 443 + 4 = 447

Exercise 12. Try these:

	A	B	C
1	234 + 49	543 + 28	356 + 37
2	482 + 48	575 + 99	368 + 87
3	428 + 69	385 + 41	434 + 81
4	562 + 194	247 + 308	475 + 190
5	328 + 297	265 + 496	834 + 596

6 What was the total calorie count of a meal consisting of a burger (498 calories) and fries (307 calories)?

Exercise 13. Try these:

	A	B	C
1	473 – 59	291 – 78	620 – 67
2	752 – 99	304 – 48	823 – 36
3	675 – 47	258 – 29	422 – 88
4	633 – 51	221 – 69	525 – 59
5	482 – 297	636 – 503	804 – 292
6	2417 – 398	5320 – 980	4280 – 2997

7 A bottle of Ibuprofen suspension originally contained 250 mL. If there is 98 mL left in the bottle, how much has the patient used?

WHOLE NUMBER ARITHMETIC

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Tidy numbers

These can be used to help us add. We add up to the 'tidy' number and then add what is left.

Example: 356 + 36
= 356 + (4 + 32)
= (356 + 4) + 32
= 360 + 32 = 392

478 + 56
= 478 + (22 + 34)
= (478 + 22) + 34
= 500 + 34 = 534

Exercise 14. Try these using 'tidy' numbers:

	A	B	C
1	68 + 73	46 + 86	73 + 49
2	143 + 28	264 + 27	338 + 44
3	354 + 68	747 + 75	488 + 67
4	935 + 96	436 + 89	584 + 39

5 The combined cost of new toys for the children's (paediatric) ward was $554 and $79. How much all together was spent?

WHOLE NUMBER ARITHMETIC

Exercise 15. Word Problems using addition and subtraction

1. A nurse poured 450mL of water into a container with 35 mL disinfectant and 12 mL detergent. What is the final volume of the mixture of liquids in the container?

2. Calculate how many mL of cordial concentrate would need to be added to 399mL of water to make a drink of 425 mL.

3. A nurse was asked to make a 260 mL hot chocolate drink for a patient. It should contain 23 mL of milk, 45 mL of syrup, and water. How much water would she need?

4. A nurse poured 60mL of disinfectant and 35 mL of detergent into 2300mL of water. Calculate the final volume of liquid giving your answer in mL.

5. Of 83 students enrolled in The Nursing and Health Science cohort at Unitec, there were 27 who did not complete the course, and 8 who failed. How many altogether passed the course?

6. Kelly is young and active and her recommended daily calorie intake is 2200 calories. She went to McDonalds and bought medium fries (1380 calories) and some ketchup (48 calories). How many calories is she still permitted if she wants to keep to the limit?

Exercise 16. Fluid balance task

In many situations, keeping accurate records and making correct calculations are very important.

> When someone is unwell, nurses often need to keep an accurate record of their **fluid balance.** This is to make sure that they correctly detect whether a patient is at risk of becoming dehydrated.
>
> The amount of fluid a patient takes in (eg. by mouth or through an infusion tube) is called their **fluid input.**
>
> The amount of fluid they lose (eg. in urine or through vomiting) is called their **fluid output**.

Your cousin is in hospital following an operation. His fluid input and output are being monitored.

Here is his fluid input record:

Time	Type of fluid	Amount
7am	Tea	300mL
9am	Water	200mL
11am	Water	300mL
12 noon	Tea	250mL
3pm	Water	170mL
4pm	Water	200mL
6pm	Coffee	250mL
9pm	Water	180mL

1) Work out his total fluid input. Use the space below to show your working:

Here is his fluid output record:

Time	Type of output	Amount
7am	Urine	330mL
8am	Vomit	150mL
10am	Urine	200mL
11am	Urine	230mL
3pm	Vomit	180mL
4pm	Urine	220mL
7pm	Urine	180mL
9pm	Urine	200mL

2) Work out his total fluid output. Use the space below to show your working:

3) The fluid balance is calculated over a 24 - hour period. It is the difference between the input and the output. Subtract your total fluid output from your total fluid input above to work out your cousin's fluid balance.

4) Fluid input and output gets recorded on a Fluid Balance Chart (FBC). Read the information carefully in the chart below and finish entering the information for your cousin as given above.
Note that the time is in 24 - hour time. For example, 0100 means 1am and 1300 means 12 hours later, so it is 1pm.

West Ward Hospital Ward: B

Clinical Skills Fluid Balance Chart
Date: 12/2/20

Family Name: Kamuka

First Name: Tyson

	INTAKE			OUTPUT				
Time	By Mouth or Tube	mL	Intravenous	mL	Urine mL	Vomit mL	Other	mL
0100								
0200								
0300								
0400								
0500								
0600								
0700	Tea	300			330			
0800						150		
0900	Water	200						
1000								
1100								
1200								
1300								
1400								
1500								
1600								
1700								
1800								
1900								
2000								
2100								
2200								
2300								
2400								
Totals								
Total Intake:				**Total Output:**				
Fluid Balance:								

The fluid output for a baby is found by weighing their nappy. The nappy needs to be weighed when it is dry. When it is wet, it is weighed again. As 1mL of liquid weighs 1gram we can work out how many mL has been passed in urine by subtracting the dry weight from the wet weight.

For example, if a dry nappy weighs 22g and, when next changed it weighs 164g, then the baby has passed 164 – 22 = 142mL of urine since the last nappy change.

Baby Petra has had respiratory problems, so her fluid balance is being carefully monitored. A record is kept of her feeds and the weight of her nappies at each change.

They produced the following record:

Feeds of formula milk:

Time	Amount (mL)
7am	130
9am	125
12 noon	135
5pm	122
7pm	140

Nappy changes:

Time	Weight of nappy (g)
8am	175
10am	132
1pm	150
5pm	143
7pm	168

Petra's dry nappies weighed 25g

Calculate how much urine Petra has passed between each nappy change. Then put all of this information onto the fluid balance chart on the following page, showing clearly her total fluid intake and output and her fluid balance.

	INTAKE				OUTPUT			
Time	By Mouth or Tube	mL	Intravenous	mL	Urine mL	Vomit mL	Other	mL
0100								
0200								
0300								
0400								
0500								
0600								
0700								
0800								
0900								
1000								
1100								
1200								
1300								
1400								
1500								
1600								
1700								
1800								
1900								
2000								
2100								
2200								
2300								
2400								
Totals								
Total Intake:					**Total Output:**			
Fluid Balance:								

Multiplying by numbers with zeros

Key Concept 1: Multiplying by numbers with zeros

1. Ignore the zeros, multiply the numbers
2. Count the zeros, place them on

To practise multiplying with zeros do Drill 7

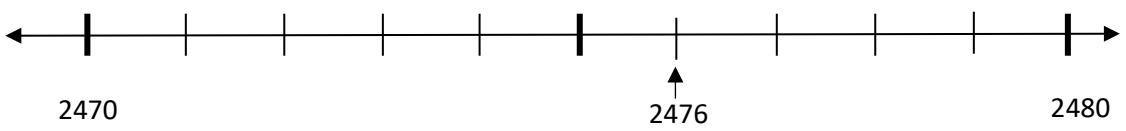
ROUNDING

We use rounding to simplify large numbers.

e.g. '2,000 people were injured in a disaster.' 'About 1200 people attended the concert.'

Example:
Round 2476 to **the nearest 10. (You will no longer include the ones, only the tens and higher.)**

2476 is between 2470 and 2480. The number line below shows you it is nearer to 2480
So 2476 rounded to the **nearest 10** is 2480.



No number line? Follow these steps:
Step 1: Underline the digit in the required place value (tens). 24<u>7</u>6
Step 2: Look to the digit on the **right** of this place value.
If this \digit is **less than 5**, the underlined digit **stays the same**
If this digit is **5 or more**, the underlined digit **goes up 1**
In this case, the digit on the right is 6 ie. more than 5, so the 7 goes up to an 8.
Step 3: Keep the same digits on the left (The 2 and the 4)
Replace the digits on the right (the 6) with zeros.
So 2476 rounds to 2480.

Remember: When we round, we must not lose the **value** of the number. We just want less **detail.**
When rounding whole numbers, the number will have the same number of digits.

Key Concept 2: Rounding

When we round a number we do not change its place value.

Exercise 17. Rounding using place value

1. Round to the nearest 10:

   (a) 24 (b) 594 (c) 2537 (d) 155

2. Round the following numbers to the nearest 1000:

   (a) 24,599 (b) 359,154

   (c) 6,712 (d) 850,370

3. Round the following numbers correct to the nearest 100:

   (a) 302,860 (b) 38,272

   (c) $20,499 (d) 5,156

4. Round the following numbers correct to the nearest thousand:

   (a) $65,835 (b) $29,999

   (c) $25,493 (d) $67,035

5. Round the following to the place value shown in brackets:

   (a) 53326 [thousands] (b) $20,499 [tens of thousands]

   (c) 5955 [hundreds] (d) 354,594 [tens of thousands]

   (e) 38272 [tens] (f) 655 [tens]

   (g) 30,449 [hundreds] (h) 354,594 [thousands]

   (i) 34,598 [tens] (j) 634,243 [hundreds]

   (k) 38,390 [hundreds] (l) 29,965 [hundreds]

   (m) 452,846 people bought tickets for a rugby final at Eden Park. What was the size of the crowd to the nearest 1000? What was the crowd size to the nearest 10,000?

Rounding to Significant Figures

What is meant by significant figures
The number of significant figures (sf) of a number is the number of non-zero digits in a number. Zeros are not considered 'significant' unless occurring between non-zero digits. (eg as in 303)
The number 7098 has 4sf. The zero here is significant as it occurs between non-zero digits.
The number 7980000 has 3 sf. The zeros after the digits 798 are not significant as they are place-holder zeros.
The number 0.0007098 has 4 sf as any zeros immediately after the decimal point are place-holder zeros and are not significant.

How to round to a given number of significant figures: Examples
The value 3526 has four significant figures.
To round 3526 to 2 significant figures (sf). Answer 3500 You still need 4 digits, but only 2 non zero digits. The last two digits become zeros because they are place holders Follow the normal rounding rules to decide whether to round your second digit up, or not.

Round 3526 to one sf. Answer 4000 Keep the same number of places in the number. Keep the first non-zero digit. Round it up because the next digit was a 5. Change the 5, 2 and 6 to zeros.

Rounding to significant figures is a useful skill for estimating answers to maths calculations.

Ex 18. Rounding to one significant figure

1. Round the following to 1 significant figure:

(a) 456

(b) $220,579

(c) 2457

(d) 384,994

(e) 9938

(f) 53,655

(g) 304

(h) 524,894

Make sure you practise rounding to one significant figure by using drill 13

Estimation of Multiplication

Key Concept 3: Estimation using multiplication

- To estimate, we round the numbers to make the calculation EASY to do in our head. If you have to write it out to solve it, it is not an estimation.
- We are finding an approximate answer
- Normally round numbers to **1 significant figure** when using multiplication to estimate.

Estimation of Multiplication calculations: Round numbers to **one significant figure** and multiply.

Example: Estimate the answer to 4657 × 342
Rounded to 1 sf is 5000 × 300 = 1,500,000
(Multiply the numbers, count the zeros very carefully and put them on the end.)

Example 2: Estimate the answer to 48 x 18
This rounds to 50 x 20.
Multiply the numbers 5 x 2 = 10
Add on two zeros. 1000 (estimated answer)

Exercise 19. Round and then estimate the answer to these multiplications.
DO NOT CALCULATE the exact answer

	A	B	C
1	424 × 76 =	913 × 743 =	6639 × 54 =
2	4437 × 82 =	1645 × 23 =	343 × 82 =
3	556 × 488 =	542 × 612 =	959 × 63 =
4	8764 × 98 =	394 × 41	37 × 7643

5 A hospital bought 42 new bedside cabinets costing $380 each. Round each number to one significant figure and estimate the approximate total price of the cabinets.

Whole Number Arithmetic: **MULTIPLICATION METHODS**

Example: $84 \times 36 =$

Estimate the answer first (round to 1 significant figure):

$80 \times 40 = 3{,}200$

Method 1: Standard Algorithm:

$$
\begin{array}{rl}
84 & \\
\times 36 & \\
\hline
504 & \text{Step 1} = 84 \times 6 = 504 \\
2520 & \text{Step 2} = 84 \times 30 = 2520 \\
\hline
3024 & \text{Step 3} = \text{Add together to give answer}
\end{array}
$$

Answer = 3,024

Method 2: Gelosia Method:

Fill in the grid. Then add numbers down the diagonal. Carry as for addition algorithm.

		8	4
	3	2/4	1/2
	6	4/8	2/4
3	0	2	4

Answer = 3,024

Method 3: Expanded method

Break your numbers into place values in a grid. Multiply each cell in the grid. Add together all your answers.

	80	4
30	2400	120
6	480	24

Answer = 2400 + 480 + 120 + 24 = 3,024

Check: is your answer close to your estimation?

Example: $108 \times 234 =$

$100 \times 200 = 20{,}000$

$$
\begin{array}{rl}
108 & \\
\times 234 & \\
\hline
432 & \text{Step 1} = 108 \times 4 = 432 \\
3240 & \text{Step 2} = 108 \times 30 = 3240 \\
21600 & \text{Step 3} = 108 \times 200 = 21600 \\
\hline
25272 & \text{Step 4} = \text{Add together to give answer}
\end{array}
$$

Answer = 25,272

		1	0	8
	2	0/2	0/0	1/6
	3	0/3	0/0	2/4
	4	0/4	0/0	3/2
2	5	2	7	2

Answer = 25,272

	100	8
200	20000	1600
30	3000	240
4	400	32

Answer = 20000 + 3000 + 400 + 1600 + 240 + 32 = 25,272

MULTIPLICATION METHODS

Exercise 20. Estimate and calculate the following.

	A	B	C
1	$24 \times 6 =$	$13 \times 7 =$	$39 \times 5 =$
2	$47 \times 8 =$	$16 \times 3 =$	23×8
3	$56 \times 4 =$	52×6	59×3
4	$84 \times 9 =$	94×4	37×7
5	$18 \times 19 =$	$52 \times 21 =$	$31 \times 12 =$
6	$43 \times 28 =$	$13 \times 13 =$	$53 \times 37 =$

7 $113 \times 43 =$ $243 \times 25 =$ $15 \times 47 =$

8 $22 \times 212 =$ $16 \times 564 =$ $37 \times 105 =$

9 $101 \times 72 =$ $49 \times 49 =$ $43 \times 211 =$

10 $5234 \times 324 =$ 4732×463 5834×341

11 A hospital bought 28 new beds at $2321 each.

a) By rounding to one significant figure, work out the approximate cost of all the beds.
b) Do a multiplication calculation to work out the exact total cost of the beds.

FURTHER USEFUL METHODS OF MULTIPLICATION

Multiplication by Rounding and Compensating

Example: 5 × 58
= 5 × 60 – 2 × 5
= 300 – 10 = 290

Example: 32 × 19
= 32 × 20 – 32
= 640 – 32 = 608

Exercise 21. Use the rounding and compensating method to calculate these:

	A	B	C
1	24 x 6	13 x 7	39 x 5
2	3 × 79	5 × 48	8 × 39
3	3 × 69	6 × 99	58 × 3
4	199 × 2	397 × 8	599 × 5
5	43 × 19	31 × 49	21 × 29

6 A public health nurse is receiving 78c petrol allowance per kilometre travelled. How much will that be for 40 kilometres?

Multiplication by Doubling and Halving

When multiplying, if you halve one number and double the other, you get the same answer.

Example: 5×14 (double 5, halve 14)
$= 10 \times 7 = 70$

Example: 16×25 (halve 16 and double 25)
$= 8 \times 50 = 400$

Practice drill 4 first

Exercise 22. Double one number, and halve the other to calculate these:

	A	B	C
1	5×64	5×72	5×26
2	4×15	4×35	4×23
3	6×50	8×35	8×150
4	25×18	14×3	45×8
5	28×50	35×16	12×45

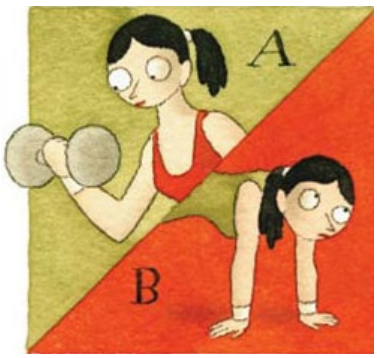
6 A medical research team paid 5 students $168 each to conduct an exercise survey on campus. How much was the students' total wages bill?

Exercise 23. Word problems using multiplication

1. A patient is to have blood tests taken two per day (bid) over two weeks. How many tests will he have in total?

2. A client is to have urine tests every four hours (q4h) for 3 weeks. How many tests will he have?

3. "A habit of moderate daily exercise will help you burn 250 calories a day."
   How many calories will be used in a week?
   How many will be used in the month of March?



4. Mary is to have medication doses 8 hourly (three times a day) for 7 days and then bid (twice a day) for 2 weeks.
   (a) How many doses each day will Mary be given for the first 7 days?

   (b) What does the abbreviation bid mean?

   (c) Nurse Betty thought 8 hourly was represented by the abbreviation q8h but nurse Rae thought 8 hourly was q3h. Which nurse is correct?

   (d) Calculate the total number of doses given to this patient over the three weeks.

   (e) Each dose is 25 mg. How much of this drug will the patient take in total over the three weeks?

Whole Number Arithmetic**:** **DIVISION**

Division by counting up or by multiplication. Useful when dividing by larger numbers.

Example: 175 ÷ 35
Count in 35's: 35, 70, 105, 140, 175 So the answer is 5

Or you may like to guess how many and multiply. e.g. $^{2}35$
x5
175

Exercise 24. Solve these.

	A	B	C
1	260 ÷ 65	260 ÷ 52	255 ÷ 85
2	120 ÷ 24	96 ÷ 16	252 ÷ 84
3	115 ÷ 23	222 ÷ 74	264 ÷ 44
4	112 ÷ 14	192 ÷ 24	322 ÷ 46
5	189 ÷ 21	231 ÷ 33	288 ÷ 36

6 A team of researchers is sharing an expenses allowance of $448. If each researcher receives $64, how many are on the team?

Dividing by numbers with zeros

Key Concept 4: Dividing by numbers with zeros

1. Cross off the same number of zeros in both numbers.
2. Divide
   (Do not put the zeros back on!)

Complete Practice Drill 8

Estimation and Division

When estimating a division problem, instead of using normal rounding to 1 significant figure we look for numbers that make the division easy. You could choose to keep the divisor the same, as in the first example below, or choose to round the divisor first, as in the second two examples, to make the problem easier.

Examples:

435 ÷ 6 is approximately 420 ÷ 6 = 70 (we choose 420 because 6 goes into 42)

2435 ÷ 28 First round 28 to 30. Then round 2435 to something that 3 will go into i.e. 2400
2400 ÷ 30 = 240 ÷ 3 (we can ignore one zero from each number)
= 80

3479 ÷ 523 First round 523 to 500. Then round 3479 to 3500 as 5 will go into 35.
3500 ÷ 500 = 35 ÷ 5 (ignore two zeros from each number)
= 7

Exercise 25. Round and Estimate the following answers; DO NOT CALCULATE the exact answer:

	A	B	C
1	693 ÷ 3	3932 ÷ 4	5932 ÷ 8
2	5563 ÷ 9	4353 ÷ 5	9302 ÷ 3
3	1324 ÷ 6	15404 ÷ 4	14943 ÷ 5
4	3789 ÷ 24	46578 ÷ 434	367 ÷ 23

5 $36123 \div 545$ $1069 \div 23$ $986 \div 17$

6 $898 \div 19$ $745 \div 84$ $6474 \div 29$

7 $972 \div 36$ $6726 \div 143$ $4065 \div 187$

8 $2121 \div 236$ $4810 \div 654$ $1500 \div 389$

9 A hospital has allocated $2100 to buy new IV stands. If they cost $198 each, approximately how many will they be able to buy? Use rounding to estimate.
Do not calculate the exact answer.

Standard Algorithm for Division of Whole Numbers

Example: Division can be written in several different ways that all mean the same. You may prefer to use the **short method** or the **long method**

$185 \div 5$ ***or*** $5\overline{)185}$ ***or*** $185 / 5$ ***or*** $\frac{185}{5}$

Estimate your answer first: 5 will go into 15 so round 185 to 150.

$150 \div 5 = 30$

Short method

$$\begin{array}{r} 37 \\ 5\overline{)1\,8^{3}5} \end{array}$$

Step 1: 5 won't go into 1 so use 18
18 ÷ 5 = 3 (Place above the 8)
Step 2: Place remainder (3)
beside the next digit (5)
Repeat
Step 1: 35 ÷ 5 = 7 (place above the 5)
Step 2: No remainder

Long method

$$\begin{array}{r} 37 \\ 5\overline{)185} \\ -\,\underline{15} \\ 35 \\ -\underline{35} \\ 00 \end{array}$$

Step 1: Divide 18 ÷ 5 = 3(place above the 8)
Step 2: Multiply 3 × 5 = 15 (write below the 18)
Step 3: Subtract to get remainder (3)
Step 4: Bring down the next number (5)
Repeat
Step 1: Divide 35 ÷ 5 = 7
Step 2: Multiply
Step 3: Subtract to get remainder (0)
Step 4: Bring down (no more numbers so finished)

Answer = 37

Check that your answer is similar to your estimation!

Use this space to practise the algorithm as above.

Exercise 26. Calculate the following: Use an estimation to check whether your answer is about right.

	A	B	C
1	$36 \div 3 =$	$144 \div 6 =$	$48 \div 4 =$
2	$115 \div 5 =$	$54 \div 2 =$	$64 \div 4 =$
3	$637 \div 7 =$	$144 \div 9 =$	$246 \div 3 =$
4	$428 \div 4 =$	$1448 \div 2 =$	$2001 \div 3 =$
5	$9\overline{)\,648}$	$8\overline{)\,984}$	$7\overline{)\,2394}$
6	2124 / 6	3625 / 5	1806 / 7
7	76/4	392/7	162/6
8	$5784 is the value of a nursing scholarship, to be spread over 6 semesters. How much will the recipient receive each semester?		

More dividing – estimation and exact answers

Remember: When dividing, be careful **to keep your numbers lined up**. If the division won't go, we must put up a zero to keep the place value.

Example: 2432 ÷ 4

Estimate first: 2400 ÷ 4 = 600

Calculate:
$$\begin{array}{r} 608 \\ 4\overline{)2433^{3}2} \end{array}$$

Check your answer is similar to your estimation. If you had left out the zero, your answer would have been 68 which is **not** similar to 600!

Exercise 27 First use your times tables knowledge to estimate, then calculate the exact answer. Watch out for the zeros!

	A	B	C
1	1224 ÷ 3 =	6444 ÷ 6 =	6428 ÷ 4 =
2	6540 ÷ 5 =	1814 ÷ 2 =	1005 ÷ 5 =
3	8256 ÷ 8 =	36531 ÷ 9 =	3535 ÷ 7 =
4	5208 ÷ 4 =	535 ÷ 5 =	8112 ÷ 3 =

5 Look at the division problem in Ex 24 and show how you would estimate the approximate amount the scholarship winner would receive each semester.

Exercise 28. Estimate these answers, then calculate the exact answers.
(Extension work)

(You may need a spare paper for guessing and trying the multiplying)

	A	B	C
1	345 ÷ 15 =	1118 ÷ 26 =	12,768 ÷ 24 =
2	6550 ÷ 25 =	1856 ÷ 32 =	2080 ÷ 65 =
3	954 ÷ 18 =	15,925 ÷ 49 =	731 ÷ 17 =

Exercise 29. Word Problems

1. 1215 people live in a town with 3 doctors. If they each have the same number of patients, how many patients do they each have?

2. 2030 people live in a town with 5 doctors. If the doctors each have the same number of clients, how many clients do they each have?

3. In a year a vet spent a total of 1096 hours treating cats and dogs and 438 hours treating cows. If she normally worked 8 hours a day, 5 days a week,

   a) How many days were spent with cats and dogs?

   b) Approximately how many weeks is this?

   c) How many days were spent with cows?

   d) Approximately how many weeks is this?

Exercise 30. Mixed Word Problems

Work out the mathematical processes required and calculate the answers.
Remember to note the type of item in the answer, e.g. injections, mL, aspirin.

a) Calculate the amount of water that must be added to 55mL of antiseptic to make 320mL of diluted solution.

b) If you add 125mL of orange concentrate to 750mL of water, what is the final volume of liquid?

c) 125 animals require five injections each. How many injections need to be prepared?

d) A client is to have four urine tests every day for three weeks. How many tests will she have?

e) Each packet of aspirin contains 240 tablets. 154 have been removed and you take 12. How many are left?

f) You stock 4 sizes of sterile pads. Three sizes are low (2, 5, 6 packets). You order replacement stock so that there are 8 packets of each size. How many do you order?

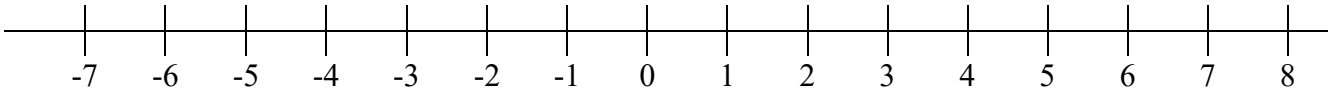
g) Five hearing tests are scheduled on Tuesday morning. If each takes 16 minutes, how long will they take altogether?

h) The vet is running 35 minutes late. Mrs J, who has the next appointment, arrived 8 minutes early. How long will she have to wait?

i) A client arrives at 6pm. He needs to take two antibiotic tablets immediately and two three times a day for the next 10 days. How many tablets will he need?

Whole number Arithmetic: **INTEGERS**

Integers include positive and negative whole numbers. They can be shown on a number line:



Examples of common uses of integers:

Temperatures
Bank Balances (in credit or debit)
Height above or below sea level

Exercise 31. Use the number line to help
(Remember go right to add a whole number, and go left to subtract a whole number).

	A	B	C
1	2 + 3 =	1 + 5 =	3 + 3 =
2	-2 + 3 =	-1 + 4 =	-3 + 5 =
3	-5 + 3 =	-6 + 4 =	-3 + 4 =
4	-1 + 5 =	-4 + 6 =	-4 + 2 =
5	-6 + 2 =	-1 + 2 =	-5 + 5 =
6	-3 + 6 =	-3 + 3 =	-1 + 7 =
7	2 – 3 =	2 – 6 =	5 – 8 =
8	1 – 4 =	4 – 9 =	3 – 7 =
9	-2 – 3 =	-4 – 1 =	-3 – 3 =
10	-1 – 5 =	-1 – 3 =	-2 – 4 =
11	4 – 6 =	0 – 4 =	1 – 2 =
12	2 – 4 =	3 – 3 =	0 – 5 =

Exercise 32. Word Problems

1. This table shows maximum and minimum temperatures on 7 July 2009 for various places around New Zealand.

	Maximum	Minimum
Kaitaia	15	7
Auckland	14	4
Taupo	10	-2
Gisborne	11	6
Whakapapa Ski field	-1	-6
Nelson	11	-1
Mt Hutt Ski field	-3	-5
The Remarkables ski field	-5	-6
Queenstown	6	-2
Invercargill	7	4

a) Which places shown had the coldest minimum temperatures?

b) Which had the hottest maximum temperature?

c) For each place, find how many degrees difference there is between the maximum and the minimum temperature.

d) How much warmer did it get in Gisborne than on Mt Hutt Ski field?

e) How much colder did it get on the Remarkables ski field than in Queenstown?

2. a) You have $25 in the bank. You withdraw $80 from your account. What is your balance now?

b) You deposit $30. What is your balance now?

c) You bank $140. What is your balance now?

3. The Pfizer Covid vaccine can be stored for up to 30 days in a temperature controlled thermal shipper which utilizes dry ice to maintain a storage temperature of -70˚C ± 10˚C. Normal body temperature is around 37˚C. What is the difference between the storage temperature for the Pfizer covid vaccine and normal body temperature?

WHOLE NUMBER ARITHMETIC

Powers (or Exponents or Indices)

The power (or exponent or index) tells us how many times to multiply a number by itself.
A power of 2 can be called a 'square'. 3^2 can be said '3 to the power of 2' or '3 squared'. Similarly a power of 3 can be called a 'cube'. 3^3 can be said '3 to the power of 3' or '3 cubed'.

Example: $3^2 = 3 \times 3 = 9$
Example: $4^3 = 4 \times 4 \times 4$
$= 16 \times 4 = 64$
Note: Anything to the power of 1 is itself eg $5^1 = 5$

Note: Anything to the power of 0 is 1 eg $5^0 = 1$

Note: A negative power means 1 over the positive power ie a fraction.
eg $5^{-2} = \frac{1}{5^2} = \frac{1}{25}$

Exercise 33. Write out and calculate:

	A	B	C
1	$1^8 =$	$1^3 =$	$1^6 =$
2	$5^2 =$	$7^2 =$	$4^2 =$
3	$2^4 =$	$2^6 =$	$2^3 =$
4	$3^3 =$	$4^3 =$	$5^3 =$
5	$10^4 =$	$10^6 =$	$10^5 =$
6	$11^2 =$	$25^2 =$	$40^2 =$
7	$3^4 =$	$6^3 =$	$4^4 =$
8	$4^0 =$	$3^0 =$	$23^0 =$
9	$16^1 =$	$54^1 =$	$78^1 =$

Whole Number Arithmetic: **ORDER OF OPERATIONS**

Remember **BEMA** (or BEDMAS). This tells the order in which to solve a calculation.

B = Brackets
E = Exponents (or Powers)
(D)M = Division and Multiplication (calculate in order of the first one that you see starting from left to right)
A(S) = Addition and Subtraction (calculate in order of the first one that you see starting from left to right)
(Note: Addition does not have priority over subtraction – they have equal priority)

Example
$3 \times 60 + 4 \times 40$
$= 180 + 160$ (solving multiplication first)
$= 340$

Example
$4^2 - 3 \times 2^2$
$= 16 - 3 \times 4$ (solving powers first)
$= 16 - 12$ (solving multiplication next)
$= 4$

Exercise 34. Solve these:

	A	B	C
1	$14 - 2 \times 3 =$	$3 \times 8 - 6 =$	$(18 - 6) \div 2 =$
2	$21 \div 3 + 4 =$	$12 - 8 + 3 \times 4 =$	$20 + 3 \times 5 - 6 =$
3	$10 - 12 \div 6 =$	$48 \div (4 + 2) + 7 =$	$36 \div (15 - 2 \times 3) =$
4	$4 \times 12 \div 8 - 6 =$	$9 \times 9 - 5 \times 5 =$	$(9 + 5) \times (9 - 5) =$
5	$16 - 3^2 - 2^2 =$	$24 \div (2^3 - 4) =$	$(32 + 23 - 7) \div 8 \times 4 =$

Exercise 35. Write mathematical statements and then solve these problems:

1. A ward has 16 rooms each with 4 beds. There are 35 patients in the ward. How many beds are free?

2. A patient has to take 3 doses per day of 10ml of medication for 1 day followed by 2 doses per day of 5ml for 4 days. How many millilitres of medication will she need altogether?

3. A bottle contains 100 tablets. A patient is prescribed 2 tablets, 3 times a day for 6 days. How many tablets will be left when she has finished her course of tablets?

4. Every day, a patient takes 3 Compazine tablets and 4 Paracetamol tablets. Once a week he takes 2 Prednisone tablets. How many tablets does he take altogether in 6 weeks?

Animal Energy Requirements (Part 1)
BER (basal energy requirement) also called RER (resting energy requirement

The amount of energy in **kilocalories** (kcal) required to sustain an animal at rest for 24 hours is called the Basal Energy Requirement (BER) and can be calculated using one of two equations.

a. For a **large dog (over 5kg).** BER = 70 + 30 × kg of bodyweight

Example: Calculate the BER for a 15 kg dog. 70 + 30 x 15 = 70 + 450 = 520 kcal.

b. For a **cat or small dog (under 5kg).** BER = 60 × kg of body weight

Example: Calculate the BER for a 2 kg cat. BER = 60 x 2 = 120 kcal daily.

Exercise 36.
Work out the BER for the following animals:

1.A 60kg Irish wolfhound

2. A 35kg Labrador

3. A 14kg cocker spaniel

4.A 3kg cat

5. Calculate the BER for your own pet(s)!

DECIMAL PLACE VALUE

Introduction to decimals

- We use decimals every time we go shopping and check if we got the right change or add up how much we spent on particular items.

- The key to the decimal system is the decimal point, which divides whole numbers from smaller parts, e.g.

$1.00 = 1 dollar

$25.50 = 25 dollars and .5 of a dollar, that is 50 cents

$12.05 = 12 dollars and .05 of a dollar, that is 5 cents

- Just as numbers larger than one have columns, decimals also have columns:

Thousands House			Starter House					Thousandths House			Millionths House		
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Tenths	Hundredths	Ones	Tens	Hundreds	Ones	Tens	Hundreds
					•								
					•								
					•								
					•								
					•								
					•								
					•								

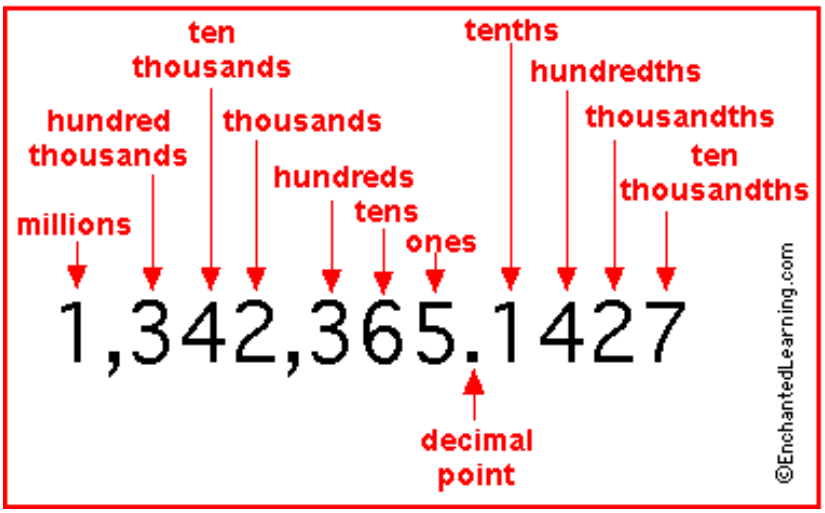
Exercise 37. Using the columns above, write in the following amounts:

a) $562
b) $12.50
c) $1.15
d) 50 cents
e) 0.00065g
f) 12,354.5km
g) 3.654L

- The columns after the decimal point are called decimal places.

- 10.5 is a number that goes to 1 decimal place.

- 2.45 goes to 2 decimal places.



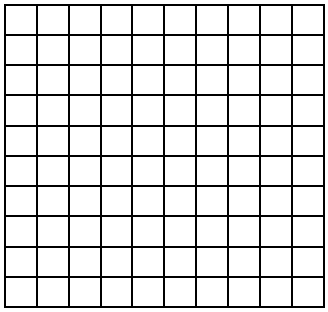
DECIMAL PLACE VALUE

Thanks to the NZ money system, you are familiar with numbers to 2 decimal places

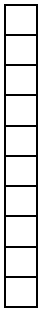
- Remember 500 is ten times bigger than 50
  5 is ten times bigger than 0.5, and
  0.5 is ten times bigger than 0.05

- In the same way 20 is ten times smaller than 200, or in other words $\frac{1}{10}$ the size of 200
  0.2 is ten times smaller than 2, i.e. $\frac{1}{10}$ the size of 2, and
  0.02 is ten times smaller than 0.2

1 whole = 1 or 1.0



1 tenth = 0.1



1 hundredth = 0.01

Ordering Decimals

Exercise 38.

1. Which is bigger?

a) 6.62 or 6.619

b) 0.7 or 0.07

c) 53.11 or 53.1

d) 978.563 or 979.563

e) 10.045 or 10.45

f) 1.1 or 11.1

g) 72.103 or 72.301

h) 0.28 or 0.3

i) 902.5 or 902.49

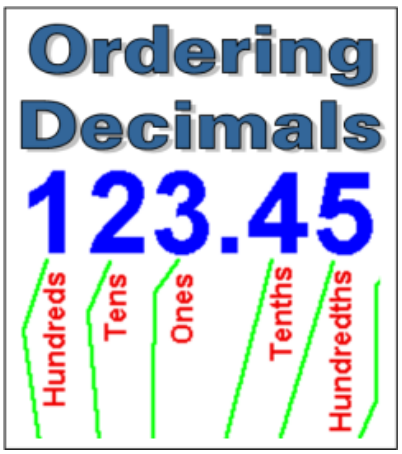
j) 7.09 or 7.909

k) 61.184 or 61.18

l) 4.007 or 4.7

2. Write these in order, smallest to largest:

a) 3.5 3.177 3.42 3.501 3.015



b) 40.04 40.404 40.4 40.004 40.444

c) 23.042 25.75 25.006 24.8 24.088 24.14

Decimal Arithmetic: **ADDITION OF DECIMALS**

Example:	3.5 + 0.7 =	25.3 + 6.1 =	12.6 + 3.25 =
Set out in columns with decimal points under one another, to line up place values			
	3.5	25.3	12.6
	+ 0.7	+ 6.1	3.25
Answer =	4.2	31.4	15.85

Exercise 39. Calculate the following:

	A	B	C
1	4.7 + 0.4 =	8.61 + 4.21 =	5.2 + 1.3 =
2	93.21 + 7.48 =	63.49 + 2.51 =	58.36 + 1.78 =
3	275.98 + 36.3 =	26.5 + 13.69 =	173.6 + 47.88 =
4	8.72 + 6.01 + 4.3 =	2.9 + 3.86 + 5.72 =	21.96 + 14.71 + 8.7 =
5	13.64 + 5 + 41.9 =	7 + 4.8 + 7.17 =	4 + 4.6 + 2.59 =
6	143.5 + 6 + 2.347 =	342 + 45.7 + 3.246 =	765.2+ 21 + 3.253 =

Exercise 40. Word Problems

1. 12.5 mg pethidine and 34.8 mg frusemide are ordered for a client. What is the total mass, in mg, of the medication given?

2. 8.5 mL erythromycin and 3.2 mL pethidine are ordered for a client.
What is the total volume in mL of drug given?

Make up a word problem involving adding decimal values. Write your problem here and give it to another student to calculate the answer.
Do you agree with the answer calculated? Can you follow the calculation steps? Discuss how you can make it easy for another person to follow your calculation method.

Key Concept 5: Adding and Subtracting Decimals
Line up the decimal points so that the place values are lined up

Decimal Arithmetic: **SUBTRACTION OF DECIMALS**

Example: 7.2 – 4.8 = 25.3 – 1.05 = 3 – 0.03

Set out in columns with decimal points under one another to line up place value
Add zeros if necessary at the end of the first number (examples 2 and 3)
If there is no decimal place, put it in at the end and add zeros as necessary (example 3)

	$^{6}\cancel{7}.\ ^{1}2$	$25.^{2}\cancel{3}^{1}0$	$^{2}\cancel{3}.\cancel{^{1}0}^{1}0$
	$-\ \underline{4.\ 8}$	$\underline{-1.\ 0\ 5}$	$\underline{-0.\ 0\ 3}$
Answer	$\underline{2.\ 4}$	$\underline{24.\ 2\ 5}$	$\underline{2.\ 9\ 7}$

Exercise 41. Calculate the following:

	A	B	C
1	6.9 – 2.5 =	3.7 – 2.3 =	8.3 – 2.5 =
2	15.25 – 2.19 =	12.91 – 8.59 =	35.64 – 6.83 =
3	243.57 – 23.2 =	11.29 – 10.4 =	128.43 – 47.6 =
4	17 – 13.67 =	1 – 0.93 =	10 – 3.78 =
5	2 – 0.05	23 – 12.65	3 – 0.94
6	14 – 3.564	43 – 5.583	21 – 9.324

Exercise 42. Word Problems

1. A child has 160.35 mL of Fanta left after drinking from a full 1000mL bottle. How many mL of Fanta has the child drunk from the bottle?

2. A child has 50.5 mL of coke left after drinking from a can that holds 330.05 mL when full. How many mL of coke has the child drunk from the can?

3. Mere went on holiday with $532 cash in her purse. So far she has spent $159.20. How much money does she still have?

4. An experiment began with 502.5 grams of salt. 121.8 grams has been used, so how much remains?

5. Make up your own problem solved by subtracting of decimal numbers. Give your problem to a friend to solve. Make sure you provide a clearly set out solution to your friend's problem. Discuss your problems and the solutions.

Decimal Arithmetic: ROUNDING

Sometimes we are given decimals with more digits than we need. For most things, one or two decimal places is plenty. Sometimes we only are interested in the whole numbers.
Remember: When we round, we must not lose the value of the number. The decimal point must stay in the same place. The answer must show exactly the number of decimal places asked for, even if this means adding some zeros which are not normally needed.

Example:
Round 4.7634 to two decimal places.
Looking at the first two digits after the decimal point, we have 4.76. We know that 4.7634 is between 4.76 and 4.77. It is closer to 4.76 so this is our answer.

If you are not sure, you can follow these steps:
Step 1: Draw a line to cut off at the required accuracy (2 decimal places). 4.76|34
Step 2: Look to the digit on the **right** of this line.
If this digit is **less than 5**, the underlined digit **stays the same**
If this digit is **5 or more**, the underlined digit **goes up 1**
In this case, the digit on the right is 3 ie. Less than 5, so the 6 stays as a 6.
Step 3: Copy the digits on the left of the line. Stop at the line
Answer: 4.76

Do Page 31 of Nursing Calculations

Exercise 43. More Practice:

1. Round the following to the nearest whole number:

a) 14.651 d) 0.468 g) 10.968475

b) 14.086 e) 6752.375 h) 409.375

c) 33.33333 f) 20.0598 i) 0.675

2. Round the following to two decimal places:

a) 0.545 d) 92.329 g) 2.666

b) 2.391 e) 0.005 h) 18.698

c) 0.333 f) 0.013 i) 0.124

3. Round the following to one decimal place:

a) 69.8253 d) 14.90186 g) 208.97

b) 203.25 e) 14.08237 h) 5.18315

c) 12.04 f) 16.298 i) 29.36815

4. Round the following to the place value shown:

a) 14.562 (1.d.p.)

d) 99.899 (whole number)

g) 59.959 (1.d.p.)

b) 2.050625 (3.d.p.)

e) 45.0645 (2.d.p.)

h) 33.3999 (3.d.p.)

c) 106.927 (whole number)

f) 1658.493 (1.d.p.)

i) 0.03125 (3.d.p.)

5.Round the following to one significant figure:

a) 0.462

d) 345.3

g) 27.456

b) 0.00876

e) 30.05

h) 0.04005

c) 12.365

f) 6.43

i) 0.0054

6.When the bank included the monthly interest on Sam's loan, the total amount calculated was $18.65731.

a) Round this to 2dp to give the amount in dollars and cents.

b) Estimate the amount of Sam's loan rounded to:

i) 2 significant figures

ii) 1sf

For more practice see Drill 13.

DECIMAL ARITHMETIC

Multiplication of Decimals

To multiply decimals: multiply as if there are no decimal points.

Add the number of decimal places in the problem.

This is the number of decimal places in the answer.

Example: 0.6 × 0.04
Multiply 6 × 4 = 24
Count the decimal places in the problem (0.6 = 1 place; 0.04 = 2 places; total = **3 places**)
Write your answer 24 with the decimal point **3 places** before the end: 0.024

ie. 0.6 × 0.04 = 0.024

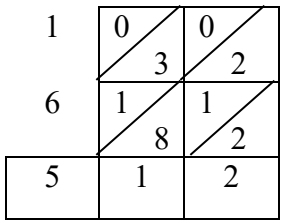
Example:3.2 × 1.6 =

Estimate the answer first as a check.
Round answers to 1 significant figure.
3.2 rounds to 3
1.6 rounds to 2 and 3 × 2 = 6 so your answer will be about 6 (not 60, 600 nor 0.6)

Then calculate:

Multiply as if there are no decimal points (use any method): 32 × 16 = 512
Add the number of decimal places in the problem.
This is the number of decimal places in the answer.

	3.2	1 decimal place plus
×	1.6	1 decimal place
	192	
	320	
Answer =	5.12	= 2 decimal places in the answer



Answer = 5.12

	30	2
10	300	20
6	180	12

300 + 180 + 20 + 12 = 512
Answer = 5.12

Check that your answer is similar to your estimate

DECIMAL ARITHMETIC

Multiplication of Decimals

Key Concept 6: Multiplying by Decimals

i. Ignore the decimal points, multiply the numbers.
ii. Count the number of decimal places in the question, count the same number in the answer.

Do page 19 of Nursing Calculations and Practice Drill 9 before continuing

Exercise 44. Estimate first, then calculate the following:

	A	B	C
1	2.4 × 6 =	7.1 × 5 =	9.34 × 4 =
2	4.3 × 43 =	8.62 × 14 =	12.71 × 16 =
3	6.23 × 25 =	5.8 × 29 =	71.3 × 23 =
4	6.25 × 0.6	23.3 × 0.4	43.8 × 0.5
5	6.23 × 0.04 =	71.86 × 0.05 =	0.84 × 0.02 =
6	12.5 × 0.13 =	11.3 × 0.21 =	53.7 × 0.36
7	23.5 × 3.42	12.7 × 6.29	97.4 × 8.43

Decimal Arithmetic: **MULTIPLICATION OF DECIMALS - Applications**

Animal Energy Requirements (Part 2):

Maintenance Energy Requirement (MER) & Ill Energy Requirement (IER)

First recheck p 48: Calculating Resting Energy Requirement (RER) (also called BER)
For dogs over 5kg:

RER = 70 + 30 × kg body weight

For a cat or small dog (under 5kg),

RER = 60 × kg body weight

MER or maintenance energy requirement refers to the extra nutrition required by an active animal.

MER = RER × 1.8

Example: Calculate the MER for a dog weighing 10 kg.

Step 1. Calculate the RER 70 + 30 x 10 = 70 + 300 = 370kcal RER.
Step 2. Calculate the MER 370 x 1.8 = 666 kcal

IER or ill energy requirement refers to the extra energy needed by an ill animal in order to help it recover from trauma or injury. The IER formula differs according to the disease or injury.

IER = RER × disease factor

Choose the appropriate disease factor from the table below:

Description	Disease Factor
Cage Rest	1.2
Surgery/trauma	1.3
Multiple surgery/ trauma	1.5
Burns/scalding	2.0

Example: Calculate the IER for a 3kg cat on cage rest, recovering from illness.

Step 1. RER = 60 x 3 = 180.
Step 3. IER = RER x disease factor = 180 x 1.2 = 216 kcal

Exercise 45

1. Calculate the MER for a
   a) 3kg rabbit

   b) 4kg cat

   c) 30kg Irish wolfhound

2. Calculate the IER for a

a) 20kg dog suffering burns from a house fire

b) 5kg cat involved in a road accident needing multiple surgery

c. A 600g tin of Ruff dog food contains 540kcal. Estimate approximately how many tins of Ruff dog food would supply the energy requirements of the Irish wolfhound in question 1c.

d) Calculate the MER for your (real or imaginary) pet.
Discuss your calculation with a friend.
Can your friend follow your calculation steps, and do you both get the same answer?

DECIMAL ARITHMETIC

Multiplication of Decimals – Applications

Target Heart Rate

Target heart rate zone gives your optimal heart rate while exercising, based on your maximum heart rate in beats per minute **(M)**

To get your maximum heart rate (**M**), in beats per minute, subtract your age from 220.
M = 220 minus your age.

Under moderate physical exercise, your **target heart rate zone** (number of beats per minute) should be between: 0.5 × **M** and 0.7 × **M**.

eg. Don is 70 so his M is 220 – 70 = 150 beats per minute.
His target heart rate zone is between .5 x 150 (=75 beats per min) and .7 x 150 (=105 beats per min)

Exercise 46.

1. a) Calculate the maximum heart rate and the target heart rate zone for a 25 year old.

Maximum Heart rate: M =
Target Heart rate zone is between: .5 x M =
.7 x M =

The target heart rate zone is between and

b) Calculate the maximum heart rate and the target heart rate zone for a 55 year old.

2. a) Calculate maximum heart rate and the target heart rate zone for yourself.

Complete the rest of the exercise as homework:

b) Use your pulse to measure your heart beat rate.

c) Do some form of moderate exercise and measure your heart rate again.

d) Are you within the target zone for your age?

Example: $21.5 \div 5 =$ $33.5 \div 4$

Follow the usual method for division
Make sure the decimal point in the answer appears above the decimal point of the number being divided
If there is a remainder at the end, keep adding zeros after the decimal point and keep dividing

```
  4. 3          4.3
5)21.15       5)21.5
             –20.0
               15
             –15
               0
```

```
  8. 3 7 5        8.375
4)33.15302 0    4)33.500
                  32
                   15
                 - 12
                    30
                  - 28
                   20
```

Answer = 4.3 Answer = 8.375

Key Concept 7: Dividing a decimal by a non-decimal

Divide, making sure to line up the decimal points
If there is still a remainder, add on zeros and keep dividing

Do Drill 10 before continuing

Exercise 47. Calculate the following:

	A	B	C
1	$3.2 \div 4 =$	$2.4 \div 6 =$	$7.5 \div 3 =$
2	$13.5 \div 5 =$	$14.7 \div 7 =$	$28.8 \div 9 =$
3	$74.4 \div 6 =$	$538.3 \div 7 =$	$834.4 \div 8 =$
4	4.48 divided by 8 =	115.8 divided by 2 =	938.7 divided by 7 =
5	1293.3 / 9 =	603.5 / 5	5138.76 / 6

DECIMAL ARITHMETIC **DIVISION OF DECIMALS**

Exercise 48. Now try these:

	A	B	C
1	54.6 ÷ 4	74.2 ÷ 4	35.3 ÷ 4
2	12.3 ÷ 8	52.7 ÷ 8	41.3 ÷ 8
3	43.5 ÷ 6	34.5 ÷ 6	79.5 ÷ 6
4	11 ÷ 5	3 ÷ 2	4 ÷ 5
5	72 ÷ 5	5 ÷ 4	27 ÷ 4

Exercise 49. Watch the zeros!

	A	B	C
1	3.52 ÷ 5	20.2 ÷ 5	370.3 ÷ 5
2	464.2 ÷ 8	13.64 ÷ 8	12.03 ÷ 8
3	322.6 ÷ 4	34.02 ÷ 4	212.2 ÷ 4
4	354.3 ÷ 6	185.7 ÷ 6	64.5 ÷ 6
5	28.56 ÷ 7	343.07 ÷ 7	224.21 ÷ 7

DECIMAL ARITHMETIC

Multiplying and Dividing by 10, 100 and 1000

The value of a digit depends on which place value column it is in. Our numbers system is called a **decimal system** where deci- means 10, because each column is worth ten times as much as the column on its right and one tenth of the column on its left.
This means to multiply a number by 10 we just need to move all the numbers one column to the left. Sometimes we need to add a zero to show that they have moved.
Multiplying by 100 is the same as multiplying by 10 twice or moving the numbers 2 places.
To divide by 10 we move the numbers one place to the right.

Thousands House			Starter House					Thousandths House			Millionths House		
Hund's	Tens	Ones	Hund's	Tens	Ones	Tenths	Hund'th	Ones	Tens	Hund's	Ones	Tens	Hund's
					•								
					•								
					•								
					•								
					•								
					•								
					•								

Do Drill 14 and pages 11 and 13 of Nursing Calculations.

Exercise 50. More practice:

	A	B	C
1	25.06 × 10 =	0.93 × 10 =	0.0623 × 10 =
2	9.451 × 10 =	25.06 × 100 =	0.93 × 100 =
3	0.0623 × 100 =	9.451 × 100 =	0.064 × 100 =
4	0.064 × 1000 =	25.06 × 1000 =	0.93 × 1000 =
5	0.0623 × 1000 =	9.451 × 1000 =	5.7 × 1000 =

Exercise 51.

	A	B	C
1	37.7 ÷ 10 =	0.27 ÷ 10 =	189.02 ÷ 10 =
2	9 ÷10 =	37.7 ÷ 100 =	0.27 ÷ 100 =
3	189.02 ÷100 =	9 ÷ 100 =	37.7 ÷ 1000 =
4	189.02 ÷ 1000 =	6.4 ÷ 1000 =	9 ÷ 1000 =

Decimal Arithmetic: **DIVIDING A NUMBER BY A DECIMAL**

When the number we are dividing by (the divisor) contains a decimal point, we cannot do the division until we have changed the divisor to a whole number. We do this by continuing to multiply **both** numbers by 10 until the divisor is a whole number.
Another way of looking at this is to move the decimal point to the end in the divisor, and move it the **same number of places** in the other number.
Remember: The answer to the division problem is the same as long as we do the **same to both numbers.**

Example $1.2 \div 0.6$
$1.2 \times 10 = 12$; $0.6 \times 10 = 6$
So $1.2 \div 0.6 = 12 \div 6 = 2$
(This makes sense: there are 2 lots of 0.6 in 1.2 and 2 lots of 6 in 12)

Example $0.462 \div 0.07$
Multiply both numbers by 100 (or move the decimal point two places to the right):
$0.462 \div 0.07 = 46.2 \div 7$

Divide $\begin{array}{r} 6.6 \\ 7\overline{)46.2} \end{array}$ Answer: 6.6

Key Concept 8: Dividing by a decimal

1. Move the decimal point the same number of places in both numbers so that you are no longer dividing by a decimal.
2. Divide (Do not move the decimal back)

Practice Drill 11 before continuing.

Exercise 52. Divide

	A	B	C
1	$16.25 \div 0.4 =$	$26.4 \div 0.8 =$	$17.5 \div 0.7 =$
2	$2 \div 0.5 =$	$3.57 \div 0.7 =$	$506 \div 0.8 =$
3	$16.3 \div 0.05 =$	$8.01 \div 0.09 =$	$3.1 \div 0.4 =$
4	$0.309 \div 0.3 =$	$0.098 \div 0.2 =$	$1000 \div 0.2 =$
5	$44.1 \div 0.9 =$	$60 \div 0.4 =$	$2.5 \div 0.08 =$

DECIMAL ARITHMETIC (Extension Work)

Exercise 53. Estimate these and then calculate:

	A	B	C
1	15.6 ÷ 2.5 =	5.76 ÷ 0.15 =	1.15 ÷ 0.23 =
2	8.4 ÷ 0.021 =	84 ÷ 3.5 =	3.66 ÷ 0.61 =
3	17.5 ÷ 0.25 =	93.8 ÷ 1.4 =	49.2 ÷ 1.2 =

Activity

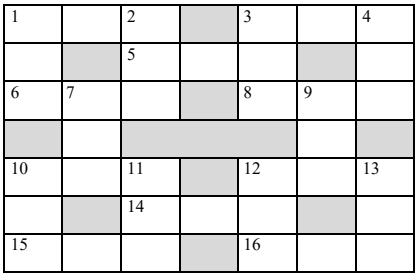
Complete the cross number: (Note that the decimal point takes up a whole square)

Across

1. 0.8 + 0.4
3. 0.7 + 0.6
5. 0.9 – 0.5
6. 66.6 + 33.4
8. 400 + 50 + 6
10. 525 – 250
12. 299.9 + 0.1
14. 11.0 – 10.9
15. 10.2 – 1.8
16. 0.6 × 3

Down

1. 11 ÷ 10
2. 199.1 + 0.9
3. 1.2 × 120
4. 4.2 – 0.6
7. 1.5 – 0.8
9. 23.4 – 18.4
10. 0.5 + 1.1 + 1.2
11. 298.7 + 205.3
12. 100.9 + 210.1
13. 1 – 0.2



Decimal Arithmetic: **DIVIDING AND ROUNDING**

Where division calculations do not work out exactly, go to one more decimal place than your final answer requires. Then round your answer to the required decimal place.

Example:

Calculate 25.4 ÷ 0.7 to 1 decimal place

Estimate first: 0.7 is already only one significant figure (7). 25.4 is approximately 21 (choosing a number which 7 goes into)

21÷ 0.7 = 210 ÷ 7 = 30 (multiplying both numbers by 10)

Calculate to two decimal places:

25.4 ÷ 0.7 = 254 ÷ 7 (multiplying both numbers by 10)

$$\begin{array}{r} 36.28 \\ \hline 7\overline{)25^{4}4.^{2}0^{6}0} \end{array}$$

Check the last digit and delete it.
As it was over 4, change the last remaining digit, 2, to 3

Round to one decimal place:

Answer = 36.3 (1 d.p.)

Exercise 54. Calculate and round the answer to 2 decimal places:

	A	B	C
1	0.4 ÷ 9 =	1.6 ÷ 9 =	25.8 ÷ 7 =
2	7 ÷ 3	39 ÷ 7	46 ÷ 9
3	47.3 ÷ 7	52.8 ÷ 9	21.3 ÷ 6

4	$42.80 ÷ 3	$102.60 ÷ 7	$7.94 ÷ 3
5	2 ÷ 0.3 =	1.7 ÷ 0.6 =	0.83 ÷ 0.3 =
6	48.508 ÷ 0.3 =	208 ÷ 0.6 =	8.046 ÷ 0.8 =
7	8.59 ÷ 7.6 =	0.47 ÷ 2.3 =	9.83 ÷ 9.5 =

DECIMAL ARITHMETIC

Exercise 55. Word Problems

a) A homeopathic first aid kit included 12 common remedies in liquid form, priced at $7.50 each, and 4 ointments, priced at $8.95 each. What was the total cost?

b) A 25mL bottle contains 0.16mL arnica in an ethyl alcohol base. Assuming the bottle is full of liquid, how much ethyl alcohol does it contain?

c) A client has drunk the following fluids:
2.5L water, 0.25L tomato juice, 0.4L soup and 1L tea
What is the total fluid intake?

d) 2.5mL erythromycin and 5.4mL pethidine are ordered for a client. What is the total volume (in mL) of drug given?

e) A syringe contains 1.5mL insulin. How much will be left in the syringe after you administer 0.6mL?

f) A client's total fluid intake was 2.42L. You forgot to note the volume of soup she drank, but you know that she consumed 0.3L tea, 0.65L orange juice. From this information work out the volume of soup she drank.

g) Eight clients each require stitches in the next hour. Assuming you will spend the same amount of time with each patient, how long can you spend with each client?

h) Seven children each require 1.3 L of water each day. How many litres (L) of water will they have consumed collectively in one day?

i) 8 people had the new UK variant of Covid 19 and they infected 4 people each. If all the newly infected people infected 5 people each, how many people were infected altogether ?

j) Make up your own word problem requiring decimal arithmetic to solve. Give your problem to a friend. Discuss the problem and the solution.

Decimal Arithmetic: **MORE ESTIMATION**

Purpose: To get a rough idea of the number you will end up with when you add, deduct, divide or multiply a complicated amount.

Method: Rounding each number to one significant figure, so that (apart from zeros) the problem becomes one you can do with your times tables. **Remember with division estimation, round the divisor first, (the number you are dividing by). Next, round the first number to a number that the divisor will go into will go in to.**

Examples:

22.5 x 1.85
becomes 20 x 2
= 40

5,375 x 287
becomes 5,000 x 300
= 5 x 3 = 15 and 5 zeros
= 1,500,000

$2.2\overline{)3\ 45\ 9\ 6}$
becomes $2\overline{)34}$
= 17

$0.7\overline{)3.5\ 4}$
becomes $0.8\overline{)3.2}$
$= 8\overline{)32}$
= 4

Do Drill 12 before continuing

Exercise 56. Practice:

NB: For this section, your workings (ie the numbers you round to) are just as important as your answer. DO NOT CALCULATE ACTUAL ANSWERS.

a) 8.9×6.2

b) 2.4×3.6

c) 58.29×10.9

d) 2594×1.3

h) $354 \div 11.6$

i) $26.4 \div 1.89$

j) $195.545 \div 8.32$

k) $1.8\overline{)5\ 59\ 5\ 5}$

e) 0.476×21.788

l) $3.2\overline{)3\,62\,7\,7}$

f) 250.985×63.7

m) $58425 \div 0.4$

g) 862×7.16

n) $638.25 / 12.3$

o) If you bought 500g cheese at $4.99, a bag of apples at $2.95, some fancy lettuce for $3.45, 2L milk at $3.85 and 2 French sticks at 1.20 each, approximately what would you spend?

p) Carmel has roughly $500 in her cheque account. She wants to buy a jumper that costs $39.25, pants that cost $52.80 and shoes on sale for $175.99. Approximately how much will be left in her account?

q) A courier who is paid 48c per kilometre clocks up 1735 kilometres in a week. Approximately how much travelling money will he get?

Times Table Tips

Tips for memorizing:
- Don't try to learn them all at once, pick 3 or 4 to work on at a time
- Write them out several times
- Say them out loud
- Remind yourself throughout the day – as you drive, walk the dog, cook dinner
- Stick them up around the house – on the fridge, by the kettle, in the toilet, by your bed. Put the answer somewhere nearby (inside the fridge, under the coffee cup!)
- Make cards with the answers on the back, go through them each night before you go to sleep
- Keep at it!!

Strategies for working out the answers quickly and accurately:
- Use tables you know, e.g. to get 6×7, start with 5×7 then add another 7.
- 4 times table: Double twice
- 6 times table: Double the 3 times table
- 8 times table: Double the 4 times table (or double 3 times)
- 9 times table: Use the fingers trick (ask a friend or your tutor to show you)

Useful websites for times tables practice:
https://quizlet.com/
- Make up your own quizzes or use other available quizzes created by others
- Quizlet also has a free phone app which includes questions as a voice option so you can even learn them with your headphones on.

	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

DRILL A 3x, 4x

3 x 7 =	6 x 3 =	3 x 8 =	21	18	24
9 x 3 =	3 x 4 =	5 x 3 =	27	12	15
4 x 3 =	8 x 3 =	3 x 6 =	12	24	18
7 x 3 =	3 x 9 =	3 x 5 =	21	27	15
4 x 4 =	9 x 3 =	8 x 3 =	16	27	24
4 x 8 =	6 x 3 =	3 x 8 =	32	18	24
4 x 7 =	5 x 4 =	9 x 4 =	28	20	36
4 x 9 =	3 x 9 =	7 x 3 =	36	27	21
8 x 3 =	8 x 4 =	4 x 8 =	24	32	32
3 x 7 =	9 x 4 =	7 x 4 =	21	36	28
4 x 7 =	4 x 6 =	6 x 4 =	28	24	24
8 x 4 =	7 x 4 =	4 x 9 =	32	28	36
4 x 6 =	9 x 4 =	3 x 4 =	24	36	12

	1	2	3	4	5	6	7	
Time:								
Correct:								

DRILL B 6x, 7x

6 x 3 =	4 x 6 =	6 x 9 =	18	24	54
8 x 6 =	6 x 6 =	6 x 7 =	48	36	42
5 x 6 =	3 x 6 =	9 x 6 =	30	18	54
6 x 8 =	6 x 4 =	7 x 6 =	48	24	42
6 x 9 =	8 x 6 =	4 x 6 =	54	48	24
7 x 6 =	7 x 7 =	7 x 8 =	42	49	56
9 x 6 =	9 x 7 =	7 x 9 =	54	63	63
8 x 6 =	4 x 6 =	4 x 7 =	48	24	28
7 x 5 =	7 x 8 =	7 x 6 =	35	56	42
9 x 7 =	8 x 7 =	7 x 7 =	63	56	49
6 x 7 =	5 x 7 =	4 x 7 =	42	35	28
3 x 7 =	2 x 7 =	7 x 3 =	21	14	21
7 x 2 =	7 x 4 =	7 x 8 =	14	28	56

	1	2	3	4	5	6	7
Time:							
Correct:							

DRILL C 8x, 9x

3 x 8 =	4 x 8 =	8 x 3 =	24	32	24
8 x 5 =	6 x 8 =	8 x 7 =	40	48	56
9 x 8 =	8 x 8 =	7 x 8 =	72	64	56
8 x 6 =	8 x 4 =	8 x 9 =	48	32	72
2 x 8 =	4 x 8 =	8 x 8 =	16	32	64
8 x 9 =	7 x 8 =	6 x 8 =	72	56	48
9 x 3 =	4 x 9 =	9 x 8 =	27	36	72
8 x 8 =	9 x 7 =	8 x 7 =	64	63	56
9 x 4 =	2 x 9 =	9 x 5 =	36	18	45
6 x 9 =	7 x 9 =	9 x 9 =	54	63	81
9 x 8 =	9 x 4 =	9 x 3 =	72	36	27
9 x 7 =	6 x 9 =	5 x 9 =	63	54	45
8 x 9 =	3 x 9 =	9 x 6 =	72	27	54

	1	2	3	4	5	6	7
Time:							
Correct:							

DRILL 1 **2×, 3×, 4×, 5×, 9×**

4 × 4 =	8 × 4 =	4 × 3 =	16	32	12
3 × 2 =	8 × 2 =	9 × 5 =	6	16	45
2 × 6 =	9 × 3 =	2 × 5 =	12	27	10
7 × 4 =	5 × 5 =	9 × 2 =	28	25	18
8 × 5 =	10 × 4 =	6 × 9 =	40	40	54
9 × 6 =	3 × 3 =	4 × 7 =	54	9	28
9 × 7 =	4 × 9 =	5 × 8 =	63	36	40
3 × 7 =	5 × 7 =	8 × 3 =	21	35	24
5 × 6 =	2 × 4 =	7 × 3 =	30	8	21
8 × 9 =	5 × 3 =	2 × 2 =	72	15	4
1 × 8 =	6 × 5 =	6 × 4 =	8	30	24
5 × 4 =	4 × 6 =	8 × 4 =	20	24	32
6 × 3 =	2 × 7 =	3 × 6 =	18	14	18
3 × 9 =	3 × 8 =	9 × 9 =	27	24	81

Attempt no	1	2	3	4	5	6	7
Date:							
Time taken:							
Number correct /42							

DRILL 2 **2× – 9×**

8 × 8 =	6 × 3 =	7 × 7 =	64	18	49
5 × 6 =	8 × 9 =	8 × 4 =	30	72	32
6 × 6 =	5 × 4 =	3 × 7 =	36	20	21
3 × 4 =	1 × 9 =	3 × 5 =	12	9	15
2 × 4 =	8 × 8 =	9 × 6 =	8	64	54
5 × 7 =	9 × 5 =	8 × 5 =	35	45	40
4 × 9 =	9 × 9 =	7 × 4 =	36	81	28
7 × 7 =	5 × 6 =	8 × 6 =	49	30	48
9 × 3 =	8 × 5 =	6 × 6 =	27	40	36
7 × 8 =	7 × 6 =	2 × 6 =	56	42	12
9 × 7 =	6 × 8 =	3 × 2 =	63	48	6
8 × 9 =	8 × 2 =	4 × 4 =	72	16	16
7 × 8 =	9 × 3 =	6 × 4 =	56	27	24
10 × 7 =	5 × 5 =	3 × 8 =	70	25	24

Attempt no	1	2	3	4	5	6	7
Date:							
Time taken:							
Number correct /42							

DRILL 3 ÷

27 ÷ 9 =	25 ÷ 5 =	40 ÷ 8 =	3	5	5
24 ÷ 6 =	27 ÷ 3 =	45 ÷ 9 =	4	9	5
70 ÷ 7 =	14 ÷ 2 =	8 ÷ 8 =	10	7	1
54 ÷ 6 =	28 ÷ 4 =	28 ÷ 7 =	9	7	4
28 ÷ 4 =	49 ÷ 7 =	32 ÷ 4 =	7	7	8
35 ÷ 5 =	30 ÷ 5 =	21 ÷ 7 =	7	6	3
16 ÷ 8 =	18 ÷ 2 =	18 ÷ 6 =	2	9	3
36 ÷ 9 =	10 ÷ 5 =	40 ÷ 10 =	4	2	4
9 ÷ 9 =	30 ÷ 10 =	48 ÷ 6 =	1	3	8
35 ÷ 7=	40 ÷ 4 =	24 ÷ 3 =	5	10	8
12 ÷ 6 =	56 ÷ 8 =	18 ÷ 6 =	2	7	3
90 ÷ 9 =	12 ÷ 2 =	30 ÷ 6 =	10	6	5
63 ÷ 7 =	12 ÷ 3 =	81 ÷ 9 =	9	4	9
72 ÷ 8 =	24 ÷ 8 =	36 ÷ 6 =	9	3	6

Attempt no	1	2	3	4	5	6	7
Date:							
Time taken:							
Number correct /42							

DRILL 4 **Doubling/Halving**

Double 26	Double 2600	Double 246	52	5200	492
Double 87	Double 90	Double 135	174	180	270
Double 810	Double 53	Double 49	1620	106	98
Double 3400	Double 84	Double 97	6800	168	194
Double 94	Double 27	Double 208	188	54	416
Double 430	Double 345	Double 76	860	690	152
Double 650	Double 25	Double 61	1300	50	122
Halve 48	Halve 110	Halve 700	24	55	350
Halve 86	Halve 66	Halve 764	43	33	382
Halve 94	Halve 900	Halve 986	47	450	493
Halve 250	Halve 760	Halve 78	125	380	39
Halve 520	Halve 844	Halve 486	260	422	243
Halve 86	Halve 750	Halve 1250	43	375	625
Halve 72	Halve 820	Halve 134	36	410	67

Attempt no	1	2	3	4	5	6	7
Date:							
Time taken:							
Number correct /42							

DRILL 5 **25 x ÷**

25 × 4 =	25 × 20 =	25 × 25 =	100	500	625
25 × 7 =	100 ÷ 25 =	175 ÷ 25 =	175	4	7
25 × 6 =	25 × 19 =	25 × 8 =	150	475	200
25 × 2 =	300 ÷ 25	600 ÷ 25 =	50	12	24
25 × 12 =	25 × 11 =	375 ÷ 25 =	300	275	15
25 × 5 =	200 ÷ 25 =	400 ÷ 25 =	125	8	16
25 × 14 =	25 × 23 =	25 × 24 =	350	575	600
25 × 9 =	25 × 11 =	150 ÷ 25 =	225	275	6
25 × 22 =	75 ÷ 25 =	275 ÷ 25 =	550	3	11
25 × 17 =	25 × 15 =	550 ÷ 25 =	425	375	22
25 × 3 =	350 ÷ 25 =	325 ÷ 25 =	75	14	13
25 × 10 =	25 × 16 =	50 ÷ 25 =	250	400	2
25 × 21 =	25 × 13 =	500 ÷ 25 =	525	325	20
25 × 18 =	250 ÷ 25 =	25 ÷ 25 =	450	10	1

DRILL 6 **×÷125, ×÷15**

15 × 3 =	125 × 2 =	45 ÷ 15	45	250	3
15 × 6 =	90 ÷ 15	135 ÷ 15	90	6	9
15 × 10 =	125 × 10 =	250 ÷ 125	150	1250	2
15 × 2 =	1250 ÷ 125	75 ÷ 15	30	10	3
15 × 9 =	15 × 2 =	1000 ÷ 125	135	30	8
125 × 4 =	150 ÷ 15	60 ÷ 15	500	10	4
15 × 7 =	125 × 9 =	30 ÷ 15	105	1125	2
15 × 12 =	15 × 8 =	875 ÷ 125	180	120	7
125 × 7 =	750 ÷ 125	625 ÷ 125	875	6	5
15 × 4 =	125 × 5 =	105 ÷ 15	60	625	7
125 × 3 =	1125 ÷ 125	500 ÷ 125	375	9	4
125 × 8 =	15 × 11 =	125 ÷ 125	1000	165	1
15 × 13 =	15 × 5 =	375 ÷ 125	195	75	3
125 × 6 =	120 ÷ 15	180 ÷ 15	750	8	12

DRILL 7 **multiplying with zeros**

80 × 200 =	400 × 600 =	30 × 15000	16 000	240 000	450 000
60 × 60 =	150 × 40 =	80 × 700 =	3 600	6 000	56 000
70 × 5000 =	780 × 200 =	40 × 90 =	350 000	156 000	3 600
30 × 4 =	3000 × 25 =	250 × 800 =	120	75 000	200 000
9 × 20 =	60 × 1200 =	40 × 70 =	180	72 000	2 800
70 × 5 =	200 × 46 =	50 × 300 =	350	9 200	15 000
2 × 600 =	400 × 110 =	20 × 900 =	1 200	44 000	18 000
800 × 3 =	1200 × 300 =	800 × 20 =	2 400	360 000	16 000
9 × 700 =	600 × 70 =	600 × 300 =	6 300	42 000	180 000
30 × 40 =	80 × 9000=	700 × 50 =	1 200	720 000	35 000
60 × 70 =	400 × 900 =	90 × 8000 =	4 200	360 000	720 000
20 × 300 =	20 × 400 =	70 × 70 =	6 000	8 000	4 900
400 × 60 =	6000 × 70 =	600 × 7 =	24 000	420 000	4 200
90 × 20 =	700 × 30 =	30 × 90 =	1 800	21 000	2 700

DRILL 8

dividing with zeros

210 ÷ 3 =	1500 ÷ 300 =	2700 ÷ 30 =	70	5	90
1500 ÷ 5 =	3200 ÷ 800 =	1400 ÷ 200 =	300	4	7
3600 ÷ 600 =	24000 ÷ 40 =	28000 ÷ 40 =	6	600	700
1800 ÷ 2 =	5600 ÷ 70 =	490 ÷ 70 =	900	80	7
1200 ÷ 300 =	800 ÷ 200 =	3000 ÷ 50 =	4	4	60
3200 ÷ 40 =	6300 ÷ 90 =	18000 ÷ 20 =	80	70	900
800 ÷ 40 =	4000 ÷ 20 =	1000 ÷ 50 =	20	200	20
360 ÷ 60 =	300 ÷ 60 =	300 ÷ 10 =	6	5	30
$\frac{63\,000}{900}$	$\frac{400\,000}{400}$	$\frac{1\,200\,000}{40\,000}$	70	1000	30
$\frac{40\,000}{800}$	$\frac{56\,000}{80}$	$\frac{1\,500\,000}{3\,000}$	50	700	500
$\frac{60\,000}{3\,000}$	$\frac{120\,000}{2\,000}$	$\frac{36\,000}{600}$	20	60	60
$\frac{160\,000}{40}$	$\frac{45\,000}{900}$	$\frac{240\,000}{3000}$	4 000	50	80

DRILL 9 multiplying with decimals

$2 \times 0.6 =$	$0.5 \times 0.07 =$	$0.2 \times 6.5 =$	1.2	0.035	1.3
$3 \times 0.3 =$	$0.7 \times 0.08 =$	$2.5 \times 0.6 =$	0.9	0.056	1.5
$5 \times 0.8 =$	$0.03 \times 0.05 =$	$0.08 \times 0.04 =$	4	0.0015	0.0032
$4 \times 0.7 =$	$0.7 \times 8 =$	$0.1 \times 58 =$	2.8	5.6	5.8
$3 \times 0.9 =$	$0.06 \times 0.7 =$	$0.7 \times 0.3 =$	2.7	0.042	0.21
$2 \times 0.08 =$	$0.02 \times 8 =$	$0.6 \times 0.8 =$	0.16	0.16	0.48
$3 \times 0.06 =$	$0.6 \times 0.1 =$	$0.01 \times 0.01 =$	0.18	0.06	0.0001
$5 \times 0.02 =$	$0.09 \times 0.06 =$	$0.01 \times 0.07 =$	0.1	0.0054	0.0007
$2 \times 0.05 =$	$0.3 \times 0.02 =$	$0.3 \times 0.2 =$	0.1	0.006	0.06
$6 \times 0.4 =$	$1.5 \times 0.2 =$	$1.2 \times 0.03 =$	2.4	0.3	0.036
$8 \times 0.3 =$	$0.04 \times 0.1 =$	$0.06 \times 0.8 =$	2.4	0.004	0.048
$7 \times 0.05 =$	$0.5 \times 0.9 =$	$0.07 \times 0.06 =$	0.35	0.45	0.0042
$5 \times 0.08 =$	$0.4 \times 0.3 =$	$9 \times 0.08 =$	0.4	0.12	0.72
$0.3 \times 0.2 =$	$0.09 \times 0.6 =$	$5 \times 0.007 =$	0.06	0.054	0.035

DRILL 10 **dividing with decimals**

1.2 ÷ 3 =	0.35 ÷ 5 =	4.2 ÷ 7 =	0.4	0.07	0.6
2.5 ÷ 5 =	0.24 ÷ 4 =	0.035 ÷ 5 =	0.5	0.06	0.007
4.8 ÷ 6 =	0.36 ÷ 9 =	7.2 ÷ 8 =	0.8	0.04	0.9
0.6 ÷ 3 =	0.48 ÷ 8 =	2.4 ÷ 4 =	0.2	0.06	0.6
2.8 ÷ 4 =	0.45 ÷ 5 =	2 ÷ 5 =	0.7	0.09	0.4
1.5 ÷ 5 =	0.072 ÷ 8 =	3 ÷ 2 =	0.3	0.009	1.5
5.4 ÷ 6 =	0.018 ÷ 3 =	0.0025 ÷ 5 =	0.9	0.006	0.0005
1.8 ÷ 9 =	0.36 ÷ 6 =	5.6 ÷ 7 =	0.2	0.06	0.8
3.2 ÷ 4 =	4 ÷ 5 =	0.024 ÷ 3 =	0.8	0.8	0.008
4.2 ÷ 6 =	1.6 ÷ 4 =	3 ÷ 5 =	0.7	0.4	0.6
2.8 ÷ 7 =	2.5 ÷ 5 =	0.15 ÷ 5 =	0.4	0.5	0.03
4.5 ÷ 5 =	0.14 ÷ 7 =	2.1 ÷ 7 =	0.9	0.02	0.3
4.0 ÷ 8 =	4.2 ÷ 6 =	0.036 ÷ 6	0.5	0.7	0.006
0.56 ÷ 7 =	0.36 ÷ 12 =	0.14 ÷ 2 =	0.08	0.03	0.07

DRILL 11 **dividing by a decimal**

1.2 ÷ 0.3 =	0.35 ÷ 0.05 =	4.2 ÷ 0.07 =	4	7	60
2.5 ÷ 0.5 =	0.24 ÷ 0.4 =	0.035 ÷ 0.5 =	5	0.6	0.07
4.8 ÷ 0.06 =	0.36 ÷ 0.9 =	7.2 ÷ 0.08 =	80	0.4	90
0.6 ÷ 0.003 =	0.48 ÷ 0.8 =	24 ÷ 0.04 =	200	0.6	600
2.8 ÷ 0.04 =	0.45 ÷ 0.5 =	2 ÷ 0.5 =	70	0.9	4
1.5 ÷ 0.05 =	0.072 ÷ 0.8 =	3 ÷ 0.2 =	30	0.09	15
5.4 ÷ 0.6 =	0.018 ÷ 0.3 =	0.0025 ÷ 0.05 =	9	0.06	0.05
1.8 ÷ 0.9 =	0.36 ÷ 0.06 =	5.6 ÷ 0.07 =	2	6	80
3.2 ÷ 0.04 =	4 ÷ 0.05 =	0.024 ÷ 0.3 =	80	80	0.08
4.2 ÷ 0.006 =	1.6 ÷ 0.04 =	3 ÷ 0.05 =	700	40	60
2.8 ÷ 0.7 =	2.5 ÷ 0.5 =	0.15 ÷ 0.0005 =	4	5	300
4.5 ÷ 0.05 =	14 ÷ 0.7 =	2.1 ÷ 0.007 =	90	20	300
4.0 ÷ 0.08 =	42 ÷ 0.6 =	36 ÷ 0.6 =	50	70	60
0.56 ÷ 0.07 =	0.36 ÷ 1.2 =	14 ÷ 0.002 =	8	0.3	7000

DRILL 12 **multiplying/dividing with zeros/decimals**

$0.8 \times 200 =$	$2000 \times 0.6 =$	$350 \div 0.5 =$	160	1200	700
$0.06 \times 60 =$	$300 \times 0.3 =$	$240 \div 0.04 =$	3.6	90	6000
$0.7 \times 5000 =$	$50\,000 \times 0.8 =$	$3.6 \div 0.9 =$	3500	40000	4
$30 \times 0.004 =$	$4000 \times 0.07 =$	$4800 \div 0.8 =$	0.12	280	6000
$0.9 \times 20 =$	$300 \times 0.9 =$	$0.45 \div 0.005 =$	18	270	90
$7000 \times 0.5 =$	$2000 \times 0.08 =$	$7200 \div 0.8 =$	3500	160	9000
$0.002 \times 600 =$	$30 \times 0.06 =$	$18000 \div 0.03 =$	1.2	1.8	600 000
$800 \times 0.3 =$	$500 \times 0.02 =$	$36 \div 0.06 =$	240	10	600
$0.9 \times 700 =$	$20 \times 0.05 =$	$40 \div 0.05 =$	630	1	800
$0.0003 \times 40 =$	$60 \times 0.04 =$	$1.6 \div 0.0004 =$	0.012	2.4	4000
$0.6 \times 70 =$	$8000 \times 0.3 =$	$25000 \div 0.5 =$	42	2400	50 000
$0.002 \times 300 =$	$70 \times 0.05 =$	$140 \div 0.7 =$	0.6	3.5	200
$4000 \times 0.6 =$	$500 \times 0.08 =$	$4200 \div 0.6 =$	2400	40	7000
$0.9 \times 200 =$	$0.3 \times 200 =$	$360 \div 0.09 =$	180	60	4000

DRILL 13 significant figures

Round these numbers to one significant figure

264	243.79	0.058	300	200	0.06
37 585	56 465.7	4.576	40 000	60 000	5
2365	1356.789	0.467	2000	1000	0.5
94 266	0.998	0.067	90 000	1	0.07
8408	7.9843	0.000567	8000	8	0.0006
294 043	78.984	0.023	300 000	80	0.02
4 565 043	23.78	0.00012	5 000 000	20	0.0001
504	129.65	0.00582	500	100	0.006
990	3567.76	0.0407	1000	4000	0.04
399	2.3784	0.932	400	2	0.9
96 706	4.6868	0.0099	100 000	5	0.01
32	21.46	0.9904	30	20	1
69	4789.54	0.0034	70	5000	0.003
3 495 403	34.67	0.0683	3 000 000	30	0.07

DRILL 14 **multiplying/dividing by 10, 100, 1000**

$0.03 \times 10 =$	$42 \times 100 =$	$16 \div 100 =$	0.3	4200	0.16
$0.7 \times 10 =$	$389 \times 100 =$	$203 \div 100 =$	7	38900	2.03
$0.5 \times 100 =$	$10 \times 3.18 =$	$84 \div 1000 =$	50	31.8	0.084
$0.09 \times 100 =$	$100 \times 0.45 =$	$3.5 \div 100 =$	9	45	0.035
$0.6 \times 10 =$	$10 \times 2.4 =$	$56.7 \div 1000 =$	6	24	0.0567
$0.45 \times 10 =$	$100 \times 8.1 =$	$0.39 \div 10 =$	4.5	810	0.039
$0.0151 \times 100 =$	$0.5 \times 100 =$	$0.042 \div 10 =$	1.51	50	0.0042
$1.7 \times 1000 =$	$240 \div 10 =$	$146 \div 10 =$	1700	24	14.6
$3.94 \times 100 =$	$14.5 \div 10 =$	$3.8 \div 100 =$	394	1.45	0.038
$6.203 \times 10 =$	$623 \div 100 =$	$23 \div 1000 =$	62.03	6.23	0.023
$0.56 \times 100 =$	$9.62 \div 10 =$	$800 \div 10 =$	56	0.962	80
$0.07 \times 1000 =$	$3 \div 10 =$	$6.44 \div 100 =$	70	0.3	0.0644
$4.9 \times 100 =$	$8 \div 100 =$	$0.3 \div 100 =$	490	0.08	0.003
$34 \times 100 =$	$2.5 \div 100 =$	$3.45 \div 1000 =$	3400	0.025	0.00345

ANSWERS

Page 3 Diagnostic Test – Number

Part A

1. Four million, thirty two thousand, three hundred and one
2. 2,300,052
3. 1501
4. 2085mL
5. 408
6. 931
7. 1115mL
8. 144
9. 52,762
10. 725
11. 107
12. 24,000
13. 4
14. 8
15. 6

Part B

1. 2046.413
2. 80.83
3. 13.2
4. 0.008
5. 430
6. 2.58
7. 4.1
8. 25.5
9. 20
10. 1.33
11. 10
12. 0.0006
13. 0.9
14. 0.04
15. 0.0072

Exercise 1

1. a) hundreds
   b) hundreds
   c) tens of millions
   d) hundreds of thousands
   e) thousands
   f) tens
   g) millions
   h) tens
   i) hundreds of thousands

2. a) 6
   b) 600,000
   c) 5000
   d) 6,000,000
   e) 50,000
   f) 800,000
   g) 80,000
   h) 3,000
   i) 60,000

Exercise 2

A

1. six hundred and forty five
2. three hundred and ninety four
3. seven thousand three hundred and ten
4. eighty three thousand, eight hundred and forty
5. twenty five thousand and four
6. four hundred and thirty thousand, five hundred and forty
7. six hundred and fifty thousand, six hundred and three
8. nine million, eight hundred thousand, four hundred and twenty one
9. twenty million, eight hundred and forty one thousand and twenty seven

B

1. nine hundred and sixty
2. four hundred and sixty eight
3. nine thousand, three hundred and six
4. forty three thousand, six hundred and two
5. seventy seven thousand, and ninety one
6. seven hundred and forty five thousand, six hundred and forty one
7. seven hundred thousand, four hundred and one
8. six million, seven hundred and one thousand, six hundred and twenty one
9. one hundred and forty three million, six hundred and ninety four thousand, and thirty eight

Exercise 3

A.	B.
1. 64	1. 52
2. 452	2. 120
3. 608	3. 259
4. 540	4. 981
5. 2465	5. 3800
6. 6007	6. 5940
7. 8706	7. 9056
8. 23,487	8. 49,708
9. 35,029	9. 60,607
10. 365,892	10. 270,464
11. 200,008	11. 387,902
12. 2,345,679	12. 3,060,054
13. 1,000,010	13. 8,429,601
14. 13,000,285	14. 9,000,067

Exercise 4

	A	B
1	100	200
2	300	1008
3	1960	900
4	1095	2050
5	1050	199
6	298	90
7	180	1,100
8	110,000	101,000
9	10,100	1,000,100
10	10,000	90,000
11	9990	999,900

Exercise 5

	A	B	C
1	177	227	177
2	321	156	259
3	367	590	1606
4	1323	1332	1372
5	166	114	81
6	793	1502	852
7	9460	1514	6526
8	1570 calories		

Exercise 6

	A	B	C
1	111	143	386
2	218	83	699
3	67	82	44
4	154	826	332
5	777	6598	2232
6	8044	1319	507
7	$37		

Exercise 7

	A	B	C
1	436	273	314
2	535	2536	7462
3	1356	1505	1675
4	16463	5076	27544
5	1670 calories		

Exercise 8

		B	C
1	260	1060	1815
2	1203	409	97
3	998	940	545
4	1389 Litres		

Exercise 9

	A	B	C
1	387	923	1818
2	656	1068	732
3	1131	562	1294
4	3135	2796	7908
5	698 mL		

Exercise 10

	A	B	C
1	13	46	31
2	52	14	37
3	58	26	83
4	224	282	555
5	757	542	182
6	279	136	501
7	422	415	284
8	467	262	381
9	443	393	562
10	318	918	660
11	135 mL		

Exercise 11

	A	B	C
1	130×2 + 4 + 1 = 265	550×2 – 2 + 3 = 1101	800×2 + 2 + 6 = 1608
2	300×2 – 6 + 5 = 599	200×2 + 2 – 2 = 400	140×2 + 2 – 3 = 279
3	240×2 + 5 + 2 = 487	250×2 + 3 + 1 = 504	150×2 + 6 + 1 = 307
4	1300×2 + 2 – 1 = 2601	2400 ×2+ 7 – 2 = 4805	7100×2 + 3 + 2 = 14205
5	1001 mL		

Exercise 12

	A	B	C
1	234 + 50 – 1 = 283	543 + 30 – 2 = 571	356 + 40 – 3 = 393
2	482 + 50 – 2 = 530	575 + 100 – 1 = 674	368 + 90 – 3 = 455
3	428 + 70 – 1 = 497	385 + 40 + 1 = 426	434 + 80 + 1 = 515
4	562 + 200 – 6 = 756	247 + 300 + 8 = 555	475 + 200 – 10 = 665
5	328 + 300 – 3 = 625	265 + 500 – 4 = 761	834 + 600 – 4 = 1430
6	805 calories		

Exercise 13

	A	B	C
1	473 – 60 + 1 = 414	291 – 80 + 2 = 213	620 – 70 + 3 = 553
2	752 – 100 + 1 = 653	304 – 50 + 2 = 256	823 – 40 + 4 = 787
3	675 – 50 + 3 = 628	258 – 30 + 1 = 229	422 – 100 + 12 = 334
4	633 – 50 – 1 = 582	221 – 70 + 1 = 152	525 – 60 + 1 = 466
5	482 – 300 + 3 = 185	636 – 500 – 3 = 133	804 – 300 + 8 = 512
6	2417 – 400 + 2 = 2019	5320 – 1000 + 20 = 4340	4280 – 3000 + 3 = 1283
7	152 mL		

Exercise 14

	A	B	C
1	141	132	122
2	171	291	382
3	422	822	555
4	1031	525	623
5	$633		

Exercise 15

1. 497ml 2. 26ml 3. 192ml 4. 2395 5. 48 6. 772 calories

Exercise16

1. 1850mL 2. 1690 mL 3. Fluid Balance 160mL 5)

	INTAKE				OUTPUT			
Time	By Mouth or Tube	mL	Intravenous	mL	Urine mL	Vomit mL	Other	mL
0100								
0200								
0300								
0400								
0500								
0600								
0700	Formula Milk	130						
0800					150			
0900	Formula Milk	125						
1000					107			
1100								
1200	Formula Milk	135						

1300					125			
1400								
1500								
1600								
1700	Formula Milk	122			118			
1800								
1900	Formula Milk	140			143			
2000								
2100								
2200								
2300								
2400								
Totals								
Total Intake: 652 mL					**Total Output: 643 mL**			
Fluid Balance: 9 mL								

Exercise 17

1	(a) 20	(b) 590	(c) 2540	(d) 160
2	(a) 25,000	(b) 359,000	(c) 7,000	(d) 850,000
3	(a) 302,900	(b) 38,300	(c) $20,500	(d) 5200
4	(a) $66,000	(b) $30,000	(c) $25,000	(d) $67,000
5	(a) 53,000	(e) 38270	(i) 34,600	
	(b) $20,000	(f) 660	(j) 634,200	
	(c) 6000	(g) 30,400	(k) 38,400	
	(d) 350,000	(h) 355,000	(l) 30,000	
	(m) 453,000	(n) 450,000		

Exercise 18

1	(a) 500	(c) 2000	(e) 10,000	(g) 300
	(b) $200,000	(d) 400,000	(f) 50,000	(h) 500,000

Exercise 19(Note your estimation may be different from these)

	A	B	C
1	400×80=32,000	900×700=630,000	7000×50=350,000
2	4000×80=320,000	2000×20=40,000 or 1600×20 =32,000	300×80=24,000
3	600×500=300,000	500×600=300,000	1000×60=60,000
4	9000×100=900,000	400×40=16,000	40×8000=320,000
5	400x40=$16,000		

Exercise 20

Note that E means “estimation of answer”; your estimation may be different to these.
C means “exact calculation of answer". Your calculated answer needs to be exactly the same as the calculated answer given here.

	A	B	C
1	E: 20×6=120 C: 144	10×7=70 91	40×5=200 195
2	E: 50×8=400 C: 376	20×3=60 48	20×8=160 184
3	E: 60×4=240 C: 224	50×6=300 312	60×3=180 177
4	E: 80×9=720 C: 756	90×4=360 376	40×7=280 259
5	20×20=400 342	50×20=1000 1092	30×10=300 372
6	40×30=1200 1204	10×10=100 169	50×40=2000 1961
7	100×40=4000 4859	200×30=6000 6075	20×50=1000 705
8	20×200=4000 4664	20×600=12,000 9024	40×100=4000 3885
9	100×70=7000 7272	50×50=2500 2401	40×200=8000 9073
10	5000×300=1,500,000 1,695,816	5000×500=2,500,000 2,190,916	6000×300=1,800,000 1,989,394
11	30x2000 =$60,000 $64,988		

Exercise 21

	A	B	C
1	4×60 – 4 = 236	6×30 – 6×2 = 168	5×100 – 5 = 495
2	3×80 – 3 = 237	5×50 – 5×2 = 240	8×40 – 8 = 312
3	3×70 – 3 = 207	6×100 – 6 = 594	60×3 – 2×3 = 174
4	200×2 – 2 = 398	400×8 – 3×8 = 3176	600×5 – 5 = 2995
5	43×20 – 43 = 817	31×50 – 31 = 1519	21×30 – 21 = 609
6	$31.20		

Exercise 22

	A	B	C
1	10×32 = 320	10×36 = 360	10×13 = 130
2	2×30 = 60	2×70 = 140	2×46 = 92
3	3×100 =300	4×70 = 280	4×300 = 1200
4	50×9 = 450	7×6 = 42	90×4 = 360
5	14×100 =1400	70×8 = 560	6×90 = 540
6	$840		

Exercise 23

1. 28tests
2. 126tests
3. 1750 calories; 7750 calories

4(a) 3 b) twice a day (c)Betty (d) 49 doses (e) 1225mg

Exercise 24

	A	B	C
1	4	5	3
2	5	6	3
3	5	3	6
4	8	8	7
5	9	7	8
6	7 researchers		

Exercise 25

	A	B	C
1	600÷3=200	4000÷4=1000	5600÷8=700
2	5400÷9=600	4500÷5=900	9000÷3=3000
3	1200÷6=200	16000÷4=4000	15000÷5=3000
4	4000÷20=200 or 3800÷20=190	48000÷400=120 or 40000÷400=100	400÷20=20
5	35000÷500=70	1000÷20=50	1000÷20=50
6	900÷20=45 or 800÷20=40	720÷80=9	6000÷30=200
7	800÷40=20 or 1000÷40=25	6000÷100=60 or 6000÷150=40	4000÷200=20
8	2000÷200=10	4900÷700=7	1600÷400=4
9	10 stands		

Exercise 26

	A	B	C
1	30÷3=10 12	120÷6=20 24	40÷4=10 12
2	100÷5=20 23	50÷2=25 27	80÷4=20 16
3	700÷7=100 91	180÷9=20 16	240÷3=80 82
4	400÷4=100 107	1400÷2=700 724	2100÷3=700 667

5	630÷9=70 72	800÷8=100 123	2100÷7=300 342
6	2400÷6=400 354	3500÷5=700 725	1400÷7=200 258
7	80÷4=20 19	420÷7=60 56	180÷6=30 27
8	$964		

Exercise 27

	A	B	C
1	1200÷3=400 408	6000÷6=1000 1074	8000÷4=2000 1607
2	5000÷5=1000 1308	1800÷2=900 907	1000÷5=200 201
3	8000÷8=1000 1032	3600÷9=4000 4059	3500÷7=500 505
4	4000÷4=1000 1302	500÷5=100 107	9000÷3=3000 2704
5	6000÷6=$1000		

Exercise 28

	A	B	C
1	E: 400÷20=20 C: 23	1200÷30=40 43	12000÷20=600 532
2	6000÷30=200 262	1800÷30=60 58	2100÷70=30 32
3	1000÷20=50 53	15000÷50=300 325	700÷20=35 43

Exercise 29

1. 405 patients 2. 406 patients 3. a) 137 days b) approximately 27 weeks

c) 54 days d) approximately 11 weeks

Exercise 30.

Word problems

(a) 265 mL	(b) 875 mL	(c) 625 injections	(d) 84 tests
(e) 74 tablets	(f) 11 packets	(g) 80 minutes = 1 hr 20 minutes	(h) 43 minutes
(i) 62 tablets			

Exercise 31

	A	B	C
1	5	6	6

2	1	3	2
3	-2	-2	1
4	4	2	-2
5	-4	1	0
6	3	0	6
7	-1	-4	-3
8	-3	-5	-4
9	-5	-5	-6
10	-6	-4	-6
11	-2	-4	-1
12	-2	0	-5

Exercise 32

1. a) Whakapapa ski field and The Remarkables ski field

b)Kaitaia

c)

Kaitaia	8
Auckland	10
Taupo	12
Gisborne	5
Whakapapa Ski field	5
Nelson	12
Mt Hutt Ski field	2
The Remarkables ski field	1
Queenstown	8
Invercargill	3

d)14 degrees

e) 4 degrees

2. a). -$55 (ie $55 Overdrawn) b). -$25 (ie $25 Overdrawn) c). $115

3. $107^{\circ}C \pm 10^{\circ}C$

Exercise 33

	A	B	C
1	1	1	1
2	25	49	16
3	16	64	8
4	27	64	125
5	10,000	1,000,000	100,000
6	121	625	1600
7	81	216	256
8	1	1	1
9	16	54	78
10	$^1/_9$	$^1/_{36}$	$^1/_{81}$

Exercise 34

	A	B	C

1	8	18	6
2	11	16	29
3	8	15	4
4	0	56	56
5	3	6	24

Exercise 35

1. $16 \times 4 - 35 = 29$ beds free
2. $3 \times 10 \times 1 + 2 \times 5 \times 4 = 70$ml
3. $100 - 2 \times 3 \times 6 = 64$ tablets
4. $(3+4) \times 7 \times 6 + 2 \times 6$ or $((3+4) \times 7 + 2) \times 6 = 306$

Exercise 36

1. 1870 kcal 2. 1120 kcal 3. 490 kcal 4. 180kcal

Exercise 38.

1. a) 6.62
   b) 0.7
   c) 53.11
   d) 979.563
   e) 10.45
   f) 11.1
   g) 72.301
   h) 0.3
   i) 902.5
   j) 7.909
   k) 61.184
   l) 4.7
2. a) 3.015 3.177 3.42 3.5 3.501
   b) 40.004 40.04 40.4 40.404 40.444
   c) 23.042 24.088 24.14 24.8 25.006 25.75

Exercise 39

	A	B	C
1	5.1	12.82	6.5
2	100.69	66	60.14
3	312.28	40.19	221.48
4	19.03	12.48	45.37
5	60.54	18.97	11.19
6	151.847	390.946	789.453

Exercise 40

1. 47.3mg 2. 11.7ml

Exercise 41

	A	B	C
1	4.4	1.4	5.8
2	13.06	4.32	28.81
3	220.37	0.89	80.83
4	3.33	0.07	6.22
5	1.95	10.35	2.06
6	10.436	37.417	11.676

Exercise 42

1. 839.65ml 2. 279.55ml 3. $372.80 4. 380.7g

Exercise 43

1	a) 15	d) 0	g) 11
	b) 14	e) 6752	h) 409
	c) 33	f) 20	i) 1
2	a) 0.55	d) 92.33	g) 2.67
	b) 2.39	e) 0.01	h) 18.70
	c) 0.33	f) 0.01	i) 0.12
3	a) 69.8	d) 14.9	g) 209.0
	b) 203.3	e) 14.1	h) 5.2
	c) 12.0	f) 16.3	i) 29.4
4	a) 14.6	d) 100	g) 60.0
	b) 2.051	e) 45.06	h) 33.400
	c) 107	f) 1658.5	i) 0.031
5	a) 0.5	d) 300	g) 30
	b) 0.009	e) 30	h) 0.04
	c) 10	f) 6	i) 0.005
6.	a) $18.66	b)i) $19	b)ii) $20

Exercise 44

	A	B	C
1	E: 2×6=12 C: 14.4	7×5=35 35.5	9×4=36 37.36
2	4×40=160 184.9	9×10=90 120.68	10×20=200 203.36
3	6×25=150 155.75	6×30=180 168.2	70×20=1400 1639.9
4	6×0.6=3.6 3.75	20×0.4=8 9.32	40×0.5=20 21.9
5	6×0.04=0.24 0.2492	70×0.05=3.5 3.593	0.8×0.02=0.016 0.0168
6	10×0.1=1 1.625	10×0.2=2 2.373	50×0.4=20 19.332
7	20×3=60 80.37	10×6=60 79.883	100×8=800 821.082

Exercise 45

1. a) RER = 180 kcal ; MER = 324 kcal
   b) RER = 240 kcal ; MER = 432 kcal
   c) RER = 970 kcal ; MER = 1746 kcal

2. a) RER = 670 kcal ; IER = 1340 kcal
   b) RER = 300 kcal ; IER = 450 kcal

3. 1500 ÷ 500 = 3 tins.

Exercise 46

1. a) M = 195 beats per minute. Target range is between 97.5 and 136.5 beats per minute
   b) M = 165 beats per minute. Target range is between 82.5 and 115.5 beats per minute

Exercise 47

	A	B	C
1	0.8	0.4	2.5
2	2.7	2.1	3.2
3	12.4	76.9	104.3
4	0.56	57.9	134.1
5	143.7	120.7	856.46

Exercise 48

	A	B	C
1	13.65	18.55	8.825
2	1.5375	6.5875	5.1625
3	7.25	5.75	13.25
4	2.2	1.5	0.8
5	14.4	1.25	6.75

Exercise 49

	A	B	C
1	0.704	4.04	74.06
2	58.025	1.705	1.50375
3	80.65	8.505	53.05
4	59.05	30.95	10.75
5	4.08	49.01	32.03

Exercise 50

	A	B	C
1	250.6	9.3	0.623
2	94.51	2506	93
3	6.23	945.1	6.4
4	64	25060	930
5	62.3	9451	5700

Exercise 51

	A	B	C
1	3.77	0.027	18.902

2	0.9	0.377	0.0027
3	1.8902	0.09	0.0377
4	0.18902	0.0064	0.009

Exercise 52

	A	B	C
1	40.625	33	25
2	4	5.1	632.5
3	326	89	7.75
4	1.03	0.49	5000
5	49	150	47

Exercise 53

	A	B	C
1	E: 15÷3=5 C: 6.24	6÷0.2=30 38.4	1÷0.2=5 5
2	8÷0.02=400 400	80÷4=20 24	3.6÷0.6=6 6
3	18÷0.3=60 70	90÷1=90 67	49÷1=49 41

Exercise 54

	A	B	C
1	0.04	0.18	3.69
2	2.33	5.57	5.11
3	6.76	5.87	3.55
4	$14.27	$14.66	$2.65
5	6.67	2.83	2.77
6	161.69	346.67	10.06
7	1.13	0.20	1.03

Exercise 55

(a) $125.80 (b) 24.84 mL (c) 4.15 L (d) 7.9 mL

(e) 0.9 mL (f) 1.47 L (g) 7.5minutes (h) 9.1L

(i) 93 hours;
3.875 days

Exercise 56

(a) $9 \times 6 = 54$	(b) $2 \times 4 = 8$	(c) $60 \times 11 = 660$ or $60 \times 10 = 600$
(d) $2600 \times 1 = 2600$	(e) $0.5 \times 20 = 10$	(f) $250 \times 60 = 15000$
or $3000 \times 1 = 3000$		or $250 \times 50 = 12500$
or $3000 \times 1.2 = 3600$		or $300 \times 60 = 18000$

(g) $900 \times 7 = 6300$	(h) $360 \div 12 = 30$ or $400 \div 10 = 40$	(i) $26 \div 2 = 13$ or $30 \div 2 = 15$
(j) $200 \div 8 = 25$ or $160 \div 8 = 20$	(k) $2\overline{)56} = 28$ or $60 \div 2 = 30$	(l) $3\overline{)36} = 12$ or $30 \div 3 = 10$
(m) $60{,}000 \div 0.5 = 120{,}000$ or $600{,}000 \div 4 = 150{,}000$ or $400{,}000 \div 4 = 100{,}000$	(n) $600 / 12 = 50$ or $600 \div 10 = 60$	(o) $5 + 3 + 3 + 4 + 1 + 1 = 17$
(p) $500 - (40 + 50 + 180) =$ $230	(q) 0.5×1700 or $1700 \div 2 =$ $850 or $50 \times 2000 = 100{,}000$cents = $1000	

Nursing for Maths Glossary

Fill in the mathematical meaning of these words as you encounter them in the course. Add any other words you find.

Addition	
Algorithm	
Applications	
Approximation	

Basic Facts	
Decimal Number	
Division	
Estimation	
Exponents	
Index/Indices	
Integer	
Multiplication	
Negative Number	
Order of Operations	
Place Value	
Positive Number	
Powers	
Rounding	
Scientific Notation	
Standard Form	
Subtraction	
Times tables	
Whole number	

Acknowledgements

The following sources have been used and material has been adapted from them:

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