

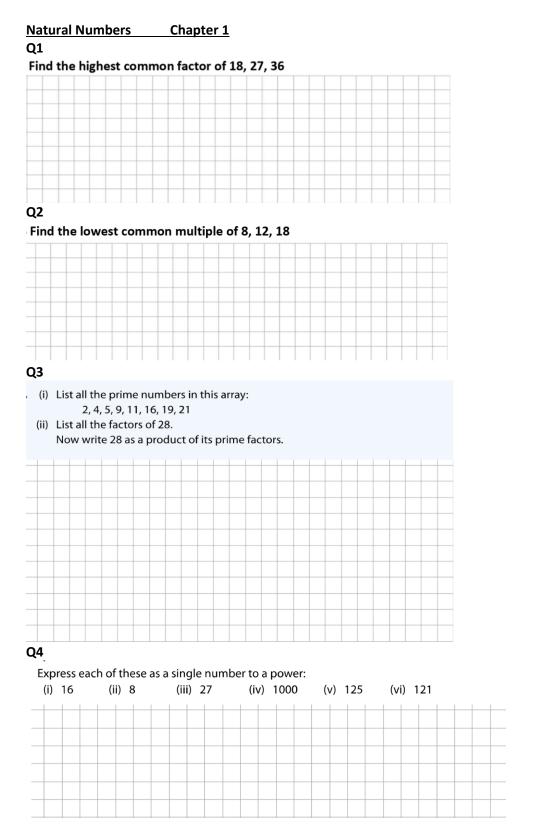
1<sup>st</sup> year

**Maths Workbook** 

2023

### 1<sup>st</sup> year Workbook 2023

# PLEASE NOTE THIS WORKBOOK IS BASED ON YOUR SUCCESS CRITERIA, PLEASE USE YOUR NOTES BOOKLET WHEN USING THIS RESOURCE TO REVISE EACH TOPIC!

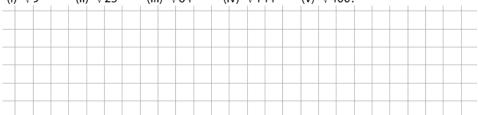


Q5 Use may use your calculator to calculate the following if necessary:

(i) √9

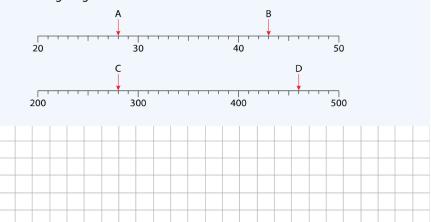
(iv) 
$$\sqrt{144}$$

(v) 
$$\sqrt{400}$$
.



Q6

Write down the values of the numbers A, B, C and D which are marked with arrows in the following diagrams:



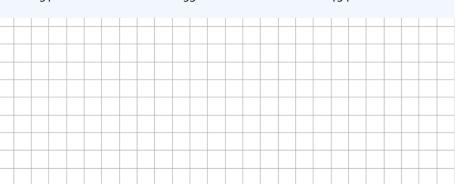
Q7

Round each number to the nearest 10 and make an estimate of the answer to each of these:

(i)  $\frac{63 \times 57}{31}$ 

(ii)  $\frac{204 \times 96}{53}$ 

(iii)  $\frac{396 \times 304}{154}$ 



Q8 Evaluate or find the value of:

(i) 
$$6 \times (5+3) - 8 \div 2$$

(ii) 
$$\frac{30 - (3 \times 2)}{4 \times 2 - 2}$$





- (i) What is the temperature reading marked A?
- (ii) What temperature is 4°C warmer than the temperature at A?
- (iii) What temperature is 12°C colder than the temperature at B?
- (iv) What is the difference between the temperatures at A and B?



### Q2 Simplify (or make easier) each of the following:

Simplify each of these:

(i) 
$$6 - 8 + 5 - 10$$

(ii) 
$$6 - (-4) + 3$$

(iii) 
$$4 \times (-3) \times (-5)$$



### Q3 Simplify (or make easier) each of the following:

(i) 
$$6 \times 4$$

(ii) 
$$-5 \times 4$$

(iv) 
$$5 \times (-9)$$

(v) 
$$-6 \times 9$$



### Q4 Simplify (or make easier) each of the following:

(i) 
$$\frac{10}{2}$$

(ii) 
$$\frac{-8}{4}$$

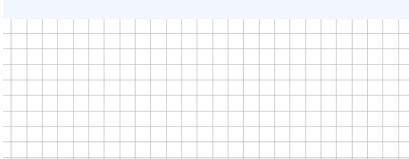
(iii) 
$$\frac{-27}{3}$$

(iv) 
$$\frac{15}{-3}$$



Copy each of the following and insert the symbols > (greater than) or < (less than) between each pair of numbers:

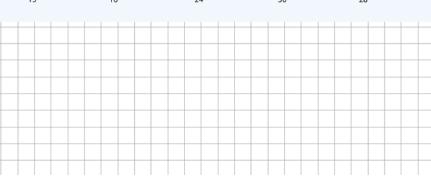
- (i) 3 \_\_\_\_ -2
- (ii) -5 -4
- (iii) 0 \_\_\_\_ -7
- (iv) -1 -8



### FRACTIONS Chapter 3

Q1 You may use your calculator if necessary to simplify these fractions (or write them in their simplest form)

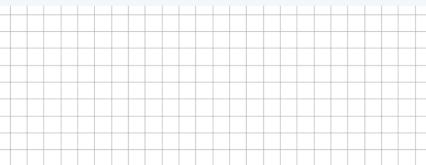
- (i)  $\frac{5}{15}$
- (ii)  $\frac{12}{16}$
- (iii)  $\frac{16}{24}$
- (iv)  $\frac{18}{30}$
- (v)  $\frac{21}{28}$



Q2

Express each of the following as an improper fraction (e.g.  $1\frac{1}{4} = \frac{5}{4}$ )

- (i)  $1\frac{1}{2}$
- (ii)  $2\frac{1}{4}$
- (iii)  $3\frac{2}{3}$
- (iv)  $4\frac{3}{4}$
- (v)  $2\frac{4}{5}$



Q3

Perform the following operations and simplify your answers where possible:

- (i)  $\frac{1}{2} + \frac{1}{3}$
- (ii)  $\frac{5}{8} + \frac{3}{4}$
- (iii)  $\frac{5}{6} + \frac{2}{3}$
- (iv)  $\frac{5}{7} + \frac{3}{14}$

(v)  $\frac{1}{2} - \frac{1}{3}$ 

(vi)  $\frac{1}{3} - \frac{1}{4}$ 

(vii)  $\frac{3}{4} - \frac{2}{3}$ 

(viii)  $\frac{3}{4} - \frac{5}{12}$ 

Q4

Express each of the following as a single fraction or whole number.

(i)  $\frac{3}{4} \times \frac{2}{5}$ 

(ii)  $\frac{1}{4} \times 8$ 

(iii)  $3\frac{1}{4} \times \frac{1}{2}$ 

(iv)  $4\frac{1}{2} \times \frac{2}{3}$ 

Q5

Simplify each of these:

(i)  $\frac{8}{9} + \frac{2}{3}$ 

(ii)  $2\frac{9}{10} - 1\frac{3}{5}$ 

(iii)  $2\frac{2}{3} \times 2\frac{1}{4}$  (iv)  $2\frac{4}{5} \div \frac{7}{10}$ 

Chapter 7 Percentages

Q1 Find

(i) 10% of 380

(ii) 40% of 680

(iii) 30% of 1680

(iv) 15% of €420

(v) 45% of €140

(vi) 80% of €910.



**Q2** Calculate

(i) Increase 90 by 10%

(ii) Increase 60 by 20%

(iii) Increase 150 by 30%

(iv) Decrease 40 by 10%

(v) Decrease 120 by 20%

(vi) Decrease 200 by 5%

The price of a certain car is €27 500.

During the month of December, the garage offers a discount of 15%.

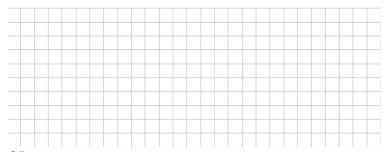
What is the price of the car during December?





### Q4

A dinner in a restaurant for 4 people cost €148. Find the total bill when VAT at 12½% was added on.



### Q5

The price of an article is  $\leqslant$ 33.60 when VAT at 20% is included. Find the price of the article before VAT is added on.



### Q6

A shopkeeper buys washing machines at  $\in$ 520 each and sells them at  $\in$ 598.

Find his percentage profit.





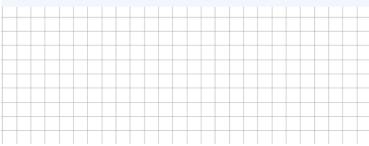
A jeweller bought a gold ring for €550 and sold it at a profit of 40%. Find the sale price.



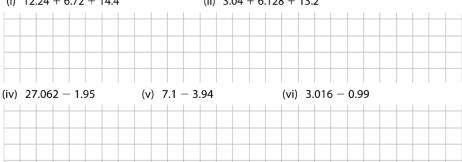
### **Decimals** Chapter 5

### Q1

- (i) Write 123.6, correct to the nearest whole number.
- (ii) Write 1.476, correct to one decimal place.
- (iii) Write 12.062, correct to two decimal places.



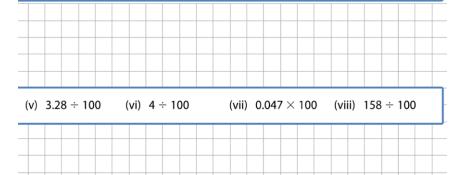
### Q2 Simplify or make easier each of the following:



### Q3

### Work these out:

- (i)  $2.3 \times 100$
- (ii)  $6.74 \times 100$
- (iii) 86 ÷ 100
- (iv)  $100 \times 0.34$

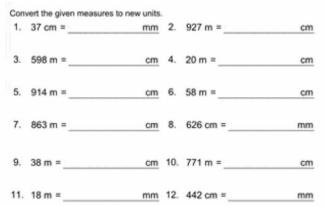


### **Converting Fractions to decimals to Percentages**

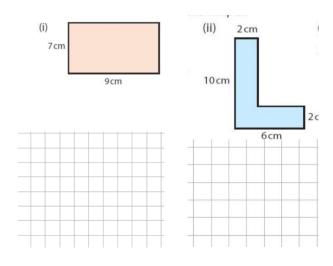
	Decimal	Fraction	Percent
1 [	.7	7/10	70%
2	.29		
3 4 5		1/10	
4			90%
	.3		
6		1/10	
7 [			61%
8 9	.07		
9 [			58%
10		19/100	

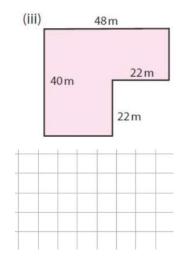
### Perimeter & Area Chapter 9

Q1

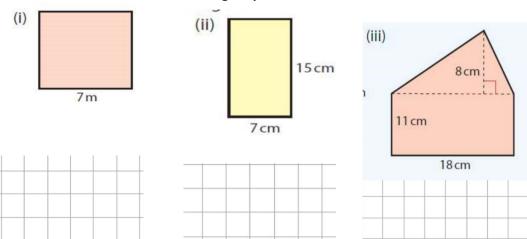


### Q2 Calculate the perimeter of the following:

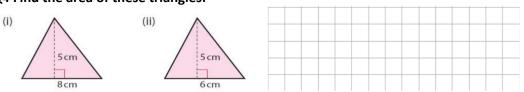




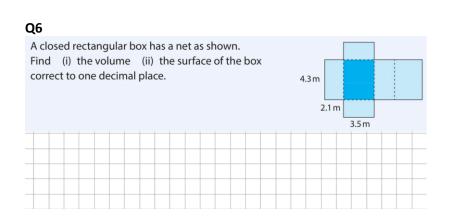
# Q3 Calculate the area of the following shapes:



# Q4 Find the area of these triangles:



# Find (i) the volume (ii) the total surface area of the given rectangular solid.



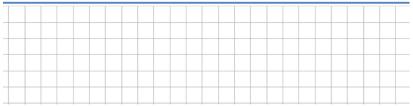
### Geometry Chapter 10

### NB Remember to revise constructions from section 10.5, videos are on OneNote

### Q1

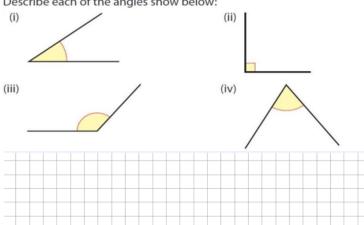
Describe in words each of the following diagrams:





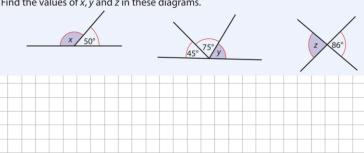
### Q2

Describe each of the angles show below:



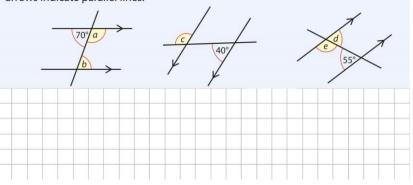
### Q3

Find the values of x, y and z in these diagrams.

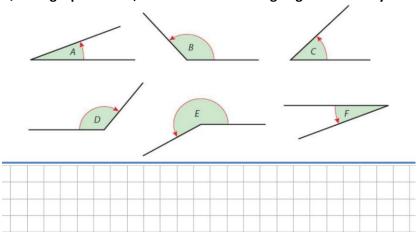


### Q4

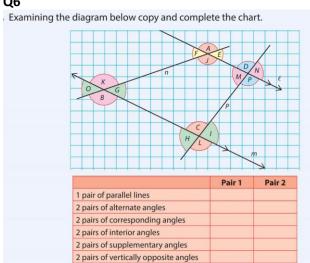
Find the size of each angle marked with a letter in the figures below, where the arrows indicate parallel lines:



Q5 Using a protractor, measure the following angles accurately



Q6

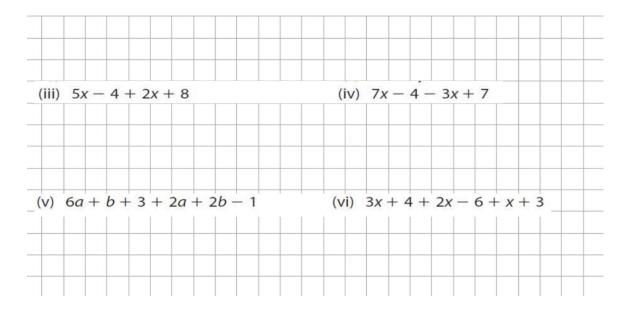


Algebra Chapter 8

Simplify (or make easier) each of the following by adding like terms: Q1

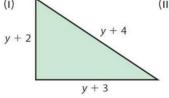
(i) 
$$12a + b + 3a + 5b$$

(ii) 
$$3x + 2y + 3 + 4x + 3y + 1$$

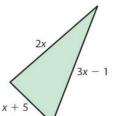


Find and simplify an expression for the perimeter (length all round) of each of the following figures:

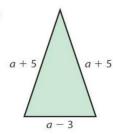
(i)



(ii)



(iii)





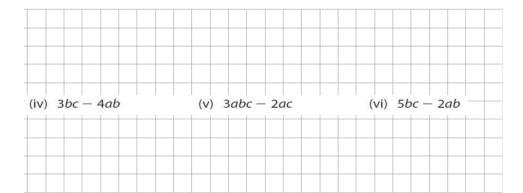
### **Evaluate (or find the value of) the following:**

If a = 1, b = 2 and c = 3, find the value of

(i) 
$$2a + b$$

(ii) 
$$3ab - c$$

(iii) 
$$4abc + 3c$$

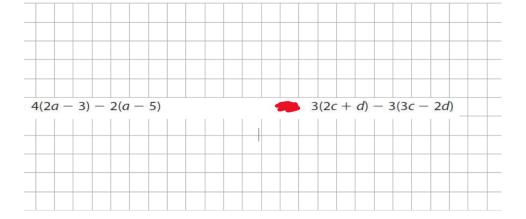


Q4 Remove the brackets by using multiplication boxes and simplify (or make easier) the answer:

$$8(a + b) - 4(2a + 3b)$$



$$\Rightarrow$$
 3(x + 2y) - 2(2x - y)



Q5 Remove the brackets by using multiplication boxes and simplify the answer:

$$2x(2x-6) - 3x(x+5)$$

$$5a(a-3)-2a(a+4)$$



Q6 Using multiplication boxes, remove the brackets & simplify your answer:

$$(3x+2)(x-3)$$

$$(3x-1)(x+4)$$

$$(5x + 2)(x - 4)$$

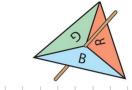


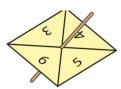
Probability Chapter 4

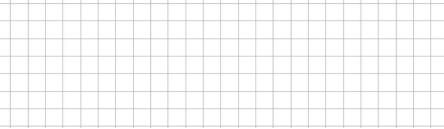
Q1

These two spinners are spun.

- (i) How many different outcomes are possible?
- (ii) List all these outcomes.



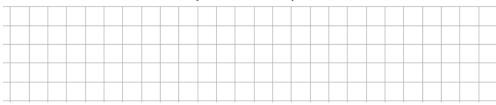




Darren is dressing up for his first interview.

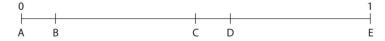
He has 5 shirts, 3 ties and 3 jackets to choose from.

If he is to wear a shirt, a tie and a jacket, how many different choices can he make?

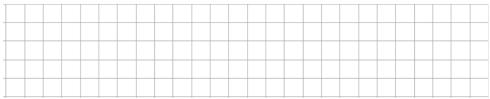


### Q3

The probability scale below shows the probability of the events A, B, C, D and E occurring.

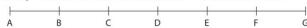


- (i) Which event has a 100% chance of happening?
- (ii) Which event has a 50% chance of occurring?
- (iii) Which event is impossible?
- (iv) Which event is very unlikely to occur?
- (v) Which event has a little more than an even chance of occurring?

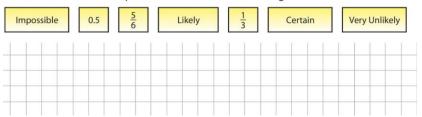


### Q4

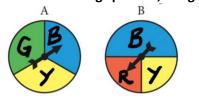
The probability scale below shows seven events – A, B, C, D, E, F and G.

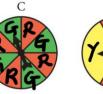


Match each letter to the phrases or fractions or decimals given below:



Q5 In the following spinners, G = green, B = blue, R = red, Y = yellow







If the spinners are spun,

- (i) Which spinner has an even chance of showing blue?
- (ii) Which spinner has an even chance of showing red?
- (iii) Which spinner has the least chance of showing yellow?
- (iv) Which spinner has one chance in three of showing yellow?
- (v) Which spinner has one chance in four of showing red?
- (vi) Which spinner has the greatest chance of showing red?

### Q6 In the following discs, 4 are black, 3 are yellow and 2 are blue discs

Sean puts these beads into a bag.

He picks one bead from the bag without looking.

- (i) Which colour is Sean least likely to pick?
- (ii) What is the probability that he picks a yellow bead?
- (iii) What is the probability that the bead is not black?
- (iv) Sean wants all colours to have an equal chance of being picked. What beads does Sean need to add to the bag?
- (v) If the probability of getting a yellow bead is to be twice the probability of getting a blue bead, what bead does Sean need to add to the bag?



### Sets Chapter 6

### Q1 What is the definition of a set?



Q2

List the elements of the following sets using the {} notation:

- A = {The first five letters of the English alphabet}
- $B = \{ \text{The odd numbers between 2 and 14} \}$
- $C = \{The seasons of the year\}$
- $D = \{The \ days \ of \ the \ week \ beginning \ with \ the \ letter \ T\}$
- E = {The letters of the word SCIENCE}
- F = {Counties in Ireland beginning with C}
- $G = \{Vowels in the word MATHEMATICS\}$
- $H = \{Colours of the rainbow\}$



Q3

Given  $X = \{1, 2, 3, 4, 5\}, Y = \{a, b, c, d, e\}, Z = \{5, 10, 15\}.$ 

Say if each of the following is true or false:

- (i)  $b \in Y$
- (ii)  $6 \in Z$
- (iii)  $f \notin Y$

- (iv)  $5 \in X$
- (v) 20 ∉ *Z*
- (vi)  $e \in Y$

- (vii) 5 ∉ *X*
- (viii)  $10 \in Z$ .

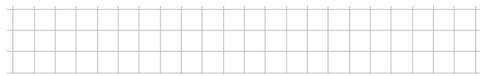
State whether each of the following is a null set:

- (i) The set of months which begin with the letter T.
- (ii) The set of men who have landed on the moon.
- (iii) The set of pupils in your class who are under 8 years of age.
- (iv) The set of whole numbers between  $3\frac{1}{4}$  and  $3\frac{3}{4}$ .
- (v) The set of women who are more than 100 years old.



### Q5

If  $X = \{\text{Letters of the word TITLE}\}\)$  and  $Y = \{\text{Letters of the word LITTLE}\}\)$ , write down the elements of set X and set Y. Is X = Y?



### Q6

 $A = \{1, 2, 3, 4, 5, 6\}, B = \{3, 4, 5, 6\}, C = \{3, 6, 9, 12\}, D = \emptyset.$ 

State whether each of the following is true or false:

(i)  $B \subset A$ 

(ii)  $B \subset C$ 

(iii)  $D \subset B$ 

(iv)  $C \subset A$ 

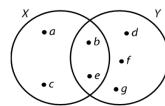
(v)  $B \subset B$ .



### Q7

From the given Venn diagram list the elements of

- (i) *X*
- (ii) *Y*
- (iii)  $X \cap Y$
- (iv)  $X \cup Y$ .

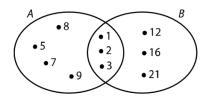


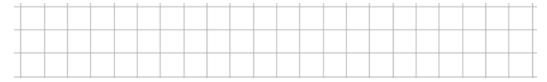


### Q8

Using the Venn diagram on the right, write down

- (i) #A
- (ii) #B
- (iii)  $\#(A \cap B)$
- (iv)  $\#(A \cup B)$ .

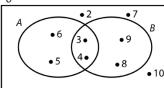




Use the given Venn diagram to list the elements of each of these sets:

- (i) A
- (ii) B
- (iii) A'

- (iv) B'
- (v)  $A \cup B$
- (vi)  $(A \cup B)$ '.



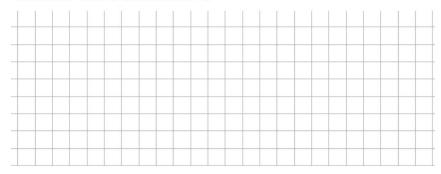


### Q10

 $U = \{1, 2, 3, 4, 5, 6, 7, 8, 10, 15, 20\}$  and  $C = \{1, 5, 10, 15, 20\}$ 

Draw a Venn diagram of these sets.

Use the Venn diagram to find the probability of choosing, at random, a number from  $\boldsymbol{U}$  that is not in  $\boldsymbol{C}$ .



### Ratio Chapter 11

### Q1

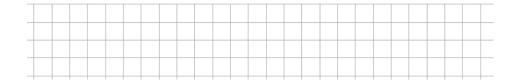
Express each of these ratios in its simplest form:

- (i) 4:2
- (ii) 15:5
- (iii) 2:10
- (iv) 8:24
- (v) 14:21

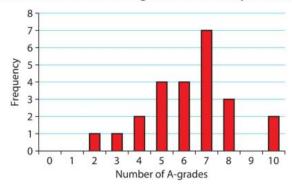


### Q2

Divide a prize of €400 between Claire and Dara in the ratio 5:3.



. The bar chart shows the number of A-grades achieved by a class of 24 pupils.



- (i) What proportion of the pupils achieved exactly 5 A-grades? Give your answer as a fraction in its simplest form.
- (ii) What proportion of the pupils achieved 5 or more A-grades? Give your answer as a fraction in its simplest form.
- (iii) What is the ratio of pupils achieving 5 A-grades to pupils achieving other results?

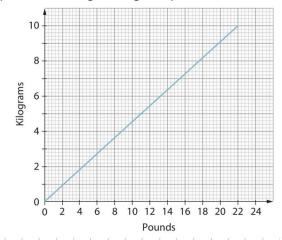


### Q4

The following is a conversion graph between kilograms (kg) and pounds (lb).

Use the graph to convert:

- (i) 20 lb to kilograms
- (ii) 10 lb to kilograms
- (iii) 4 kg to pounds
- (iv)  $6\frac{1}{2}$  kg to pounds.



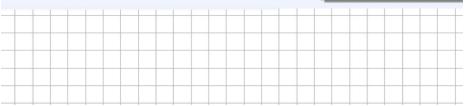
Q5

Darina uses this recipe to make apple crumble. She wants to make it for 10 people.

- (i) How much flour does she need?
- (ii) How much butter does she need?
- (iii) How many apples does she need?

Apple crumble
for 4 people

4 large apples
50 g butter
100 g sugar
200 g flour



Denise carried out a survey to find how students travelled to school. Her frequency table looked like this:

Method of travel	Tally	Frequency
Walk	шшшшшшш	Α
Car	<b>ШЖШ</b>	В
Bus	шшшшшш	С
Bicycle	Ш	D
Taxi	11	Е

- (i) Write down the values for A, B, C, D and E.
- (ii) What is the most common way of travelling to school?
- (iii) What fraction of the students cycled to school?
- (iv) Which two methods of travel were used by exactly one half of the studen

### Q2

Daniel wrote down the numbers of minutes his phone calls lasted.

8 10 16 3 24 25 30 36 17 19 11 3 17 19 23 26 16 18 2 1

Make a copy of this data collection sheet.

Fill it in.

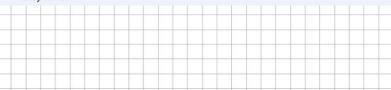
What percentage of calls lasted between 11 and 20 minutes inclusive?

Number of minutes	Tally	Frequency
1–10		
11-20		
21-30		
31-40		

### Q3

State whether each of the following results is numerical or categorical data.

- (i) Standing at a supermarket exit door and asking the customers what they thought of the service they had received.
- (ii) Checking Garda records to find the number of road-traffic accidents that occurred during the past month.
- (iii) Counting the number of cars that turn left at a particular junction.
- (iv) Checking the internet to find the most popular cars.
- (v) Asking all the students in your class to give the numbers of sisters and brothers they have.



### Q4

Here are some questions that are not suitable for a question naire.  $% \label{eq:controlled}$ 

Why do you think that they are not suitable? Suggest a better question.

 ${\bf Q1.}\,$  Most people agree that it would be a good thing to lower the drink-drive limit. Do you?

Yes No Don't know

**Q2.** Do you agree that we need a change of National Anthem?

Yes No Don't know

Q3. Soccer is more exciting to watch than rugby.

Do you agree?

Yes No Don't know

The line plot below shows the number of goals scored per match on a Saturday afternoon in a football league.



- (i) What does each dot represent?
- (ii) How many matches were played on that Saturday?
- (iii) In how many matches were 3 goals scored?
- (iv) In how many matches was an even number of goals scored?
- (v) How many matches ended in a 0-0 draw?
- (vi) What is the greatest number of matches that could have ended 2-2?



### Q2

The frequency table below shows the numbers of text messages received by a group of students on a particular day:

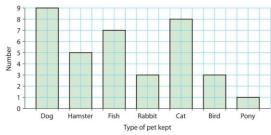
No. of messages	1	2	3	4	5	6	7
Frequency	2	4	4	7	5	4	2

- (i) Represent this data using a line plot.
- (ii) How many students were in the group?
- (iii) How many students received 5 text messages or more?
- (iv) What percentage of the group received 4 text messages?



### Q3

The bar chart below shows the type of pet kept by members of a youth club. No member kept more than one type of pet.



- (i) Which was the most popular pet?
- (ii) How many members kept a pet?
- (iii) What percentage of the pets were dogs?
- (iv) Which was the third most popular pet?
- (v) What fraction of the pets were rabbits?



The result of throwing a dice 30 times is shown.

1	2	3	3	5	2	1	6	5	4	
2	4	5	3	2	3	1	4	2	6	
6	3	6	5	3	1	3	4	6	5	

- (i) Copy and complete the frequency table for these scores.
- (ii) Draw a bar chart to show the data. Which score occurs most often?

Score	Tally	Frequency
1		
2		
3		
4		
5		
6		



### Q5

The stem and leaf plot below shows the ages of the first 25 customers to enter a shop one morning.

- (i) What age was the youngest customer?
- (ii) How many customers were aged between 20 and 30 years inclusive?
- (iii) What fraction of customers were aged between 30 and 40 years?
- (iv) How many customers were in their teens?
- (v) How many were younger than the oldest customer?



### Q6

The numbers of points gained by the teams in a football league at the end of the season are as follows:

38 62 33 46 24 53 47 66 41 62 38 80 46 45 51 54 39 52 62 34

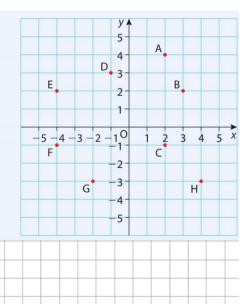
- (i) Draw a stem and leaf plot to represent this data.
- (ii) How many teams got 60 or more points?
- (iii) What was the difference between the highest and lowest number of points?
- (iv) What percentage of the teams scored between 40 and 50 points?



Co-ordinates Chapter13

Q1

Write down the coordinates of each labelled point:

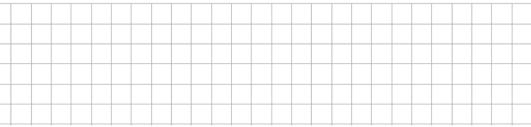


Q2 Using the graph above, state which quadrant the points A, E, G & H lie in.



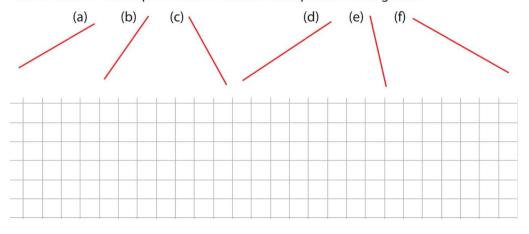
### Q3 Using the midpoint formula or otherwise

Find the midpoint of the line segment joining A(-3, 6) and B(5, -6). On which axis does the midpoint lie?



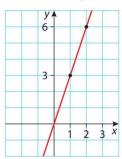
Q4

State whether the slope of each of these lines is positive or negative:

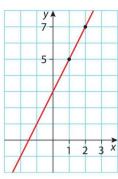


Work out the slope of each of the lines below:

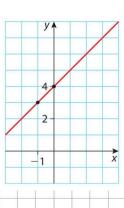
(i)

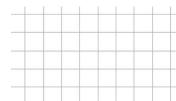


(ii)



(iii)





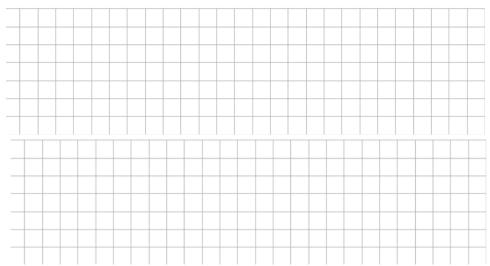
Q6 Using the slope formula or otherwise

Find the slope of the line through each pair of points:

(iv) 
$$(-2, 4)$$
 and  $(2, 6)$ 

(v) 
$$(1, 5)$$
 and  $(3, -1)$ 

(vi) 
$$(-3, 2)$$
 and  $(1, -4)$ 

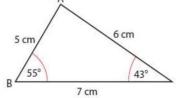


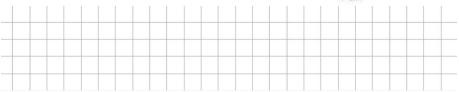
**Geometry 2** Triangles Chapter 15

NB remember to learn the constructions from section 15.4 Q1

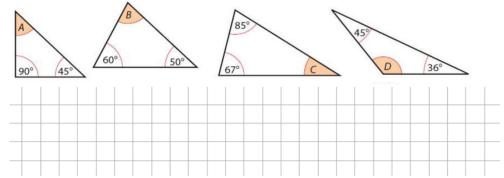
For the given triangle, write down

- (i) |∠ABC|
- (ii) |∠ACB|
- (iii) |∠BAC|
- (iv) AB
- (v) AC
- (vi) |BC|



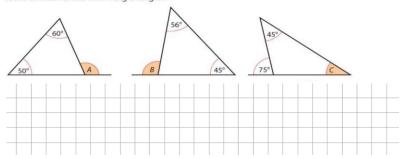


Find the size of the angle marked with a letter in each of the following triangles:



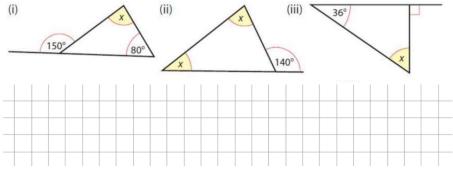
### Q3

Remembering that a straight angle is  $180^\circ$ , find the size of the angle marked with a letter in each of the following triangles:



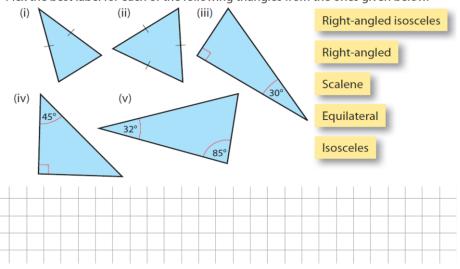
### Q4

Find the value of x in each of these triangles:



### Q5

Pick the best label for each of the following triangles from the ones given below.



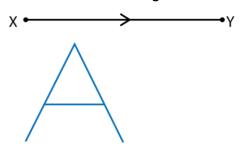
Say whether each of these statements is true or false:

- (i) A triangle can have two right angles.
- (ii) A triangle can have a right angle and two acute angles.
- (iii) A triangle can have an acute angle and two obtuse angles
- (iv) A triangle can contain a right angle and an obtuse angle.
- (v) An equilateral triangle could contain a right angle.

### **Transformations**

### **Chapter 17**

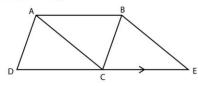
### Q1 Draw a sketch of the image of the letter A shown below under the given translation:





Q2

ABCD and ABEC are parallelograms.



Under the translation  $\overrightarrow{\mathsf{CE}}$ , write down the image of

(i) the point A (ii)

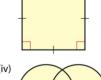
(ii) [AD]

(iii) △ADC

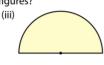
(iv) [AC].

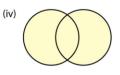
Q3

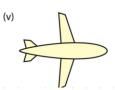
How many axes of symmetry has each of the following figures?

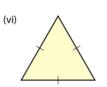








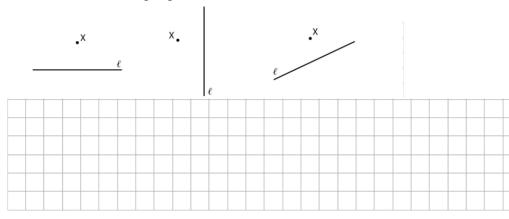






Q4

Use a set square and ruler to construct the image of X by  $S_{\ell}$ , axial symmetry in the line  $\ell$ , in each of the following diagrams:

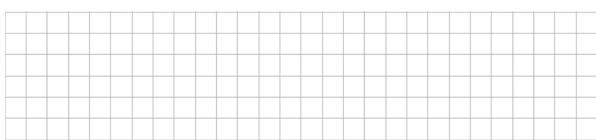


Q5a Draw a rough sketch of the image of each of the following letters under central symmetry in the point X:









Q5b Describe how each image above appears in relation to the original figure.



Solving equations Chapter 14

Q1 Solve each of the following equations, i.e. find the value of x

**2.** x + 4 = 10

- 3. x + 6 = 18
- **4.** x + 7 = 12
- **5.** x + 3 = 11



Q2 Solve each of the following equations, i.e. find the value of  $\boldsymbol{x}$ 

- **2.** 3x + 3 = 2x + 7
- 3. 8x + 5 = 7x + 10
- **4.** 5x + 2 = 4x + 8



Q3 Solve each of the following equations, i.e. find the value of x by removing the brackets

**5.** 
$$3(2x + 1) = 33$$

**6.** 
$$4(2x-3)=36$$



Q4 Solve each of the following equations, i.e. find the value of x by removing the brackets

9. 
$$3(2x-10)=2x+10$$

**10.** 
$$5(2x-1)=8x+7$$



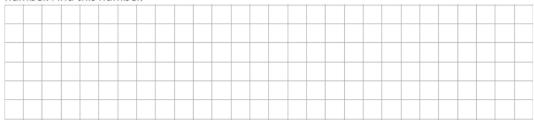
Q5

**13.** 
$$3(5x-2)=4(3x+6)$$

**14.** 
$$5(3x-2) = 7(2x-1)$$

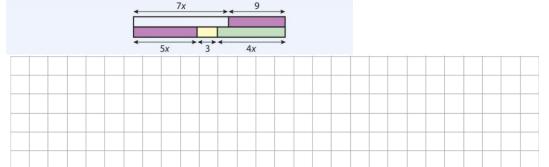


If I multiply a number by 3 and then subtract 4, the result is the same as twice the number. Find this number.



### Q7

Write down two expressions for the length of the given figure. By equating the lengths, solve the equation to find the value of x.



### Q8

The given rectangle measures (3x - 7) cm by (x + 5) cm.

Find the value of x if the rectangle is a square.





What topics am I happy with:
What topics did I find difficult:
How can I improve the topics I found difficult:
Trow can't improve the topics i round anneart.

This page is to be used to reflect on your learning!