Sparx Maths

Year 8 Term 3

Revision Workbook

About this workbook

This workbook supports the revision of topics covered in **Year 8 Term 3** of the Sparx Maths Curriculum.

The workbook is divided into two sections:

- **Fluency questions** on each unit to practise the key concepts.
- **Mixed questions** on all topics to strengthen and deepen understanding.
  This section contains more challenging reasoning questions, cross-topic questions and problem solving questions.

If you use Sparx Maths you can find more questions and videos by searching for the following Sparx topic codes in Independent Learning.

Topic codes are also given with each question.

Units	Sparx topic codes
Plotting graphs and finding equations	M797 M932 M544
Transforming shapes	M139 M290
Finding unknown angles	M679 M319 M606 M393 M653
Drawing and interpreting statistical diagrams	M574 M165 M140 M183 M648 M210 U854
Linear inequalities	M384 M118
Double brackets	M960
Fractions review	M645 M619
Algebraic fractions	M754 M336
Fractions and recurring decimals	M701 M922

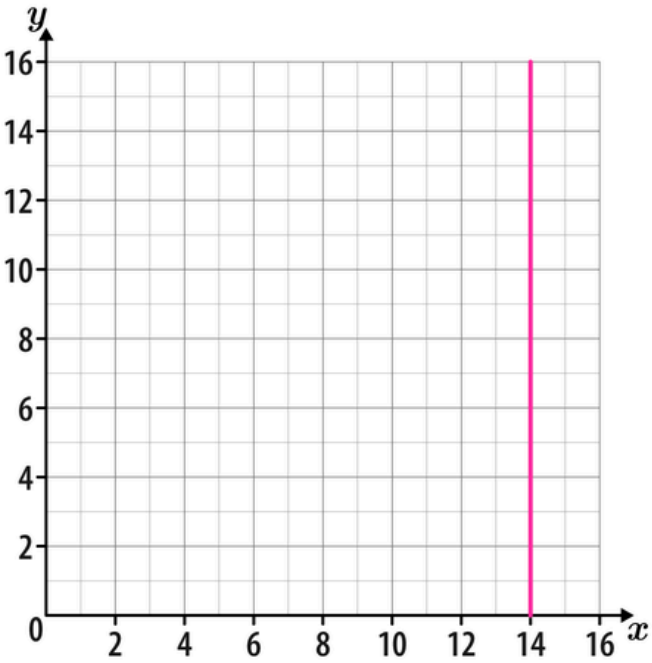
Calculator questions are marked with this symbol

Non-calculator questions are marked with this symbol

Q1

M797

What is the equation of this line?

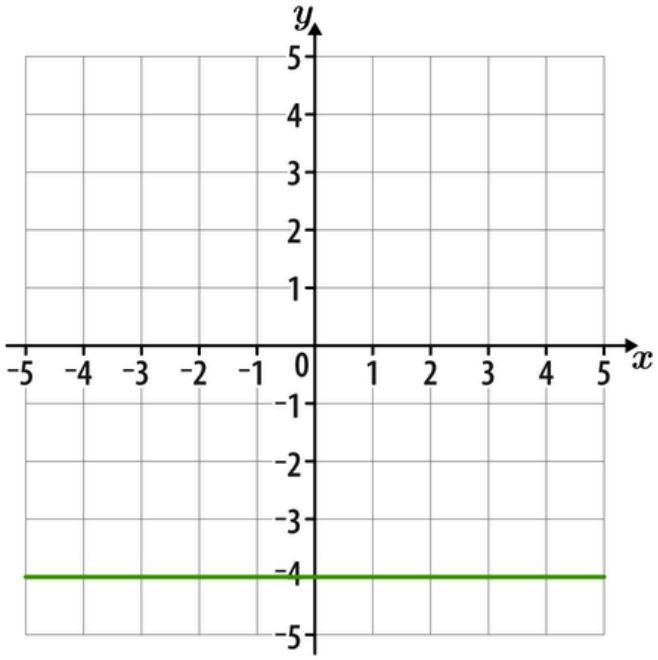


Answer: .....

Q2

M797

What is the equation of the line?

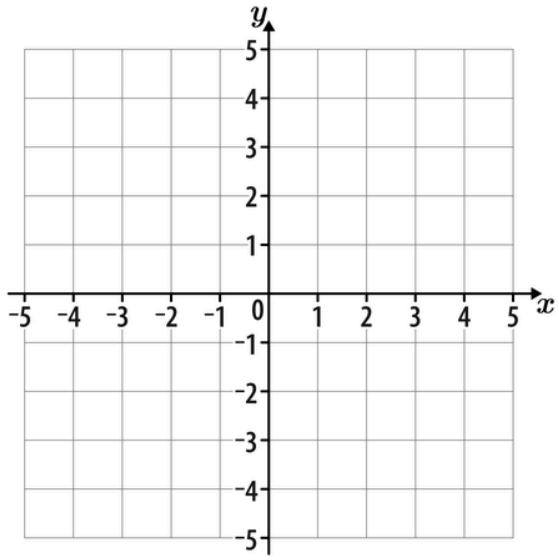


Answer: .....

Q3

M797

Draw the lines $x = 3$ and $y = -2$ on the grid below.

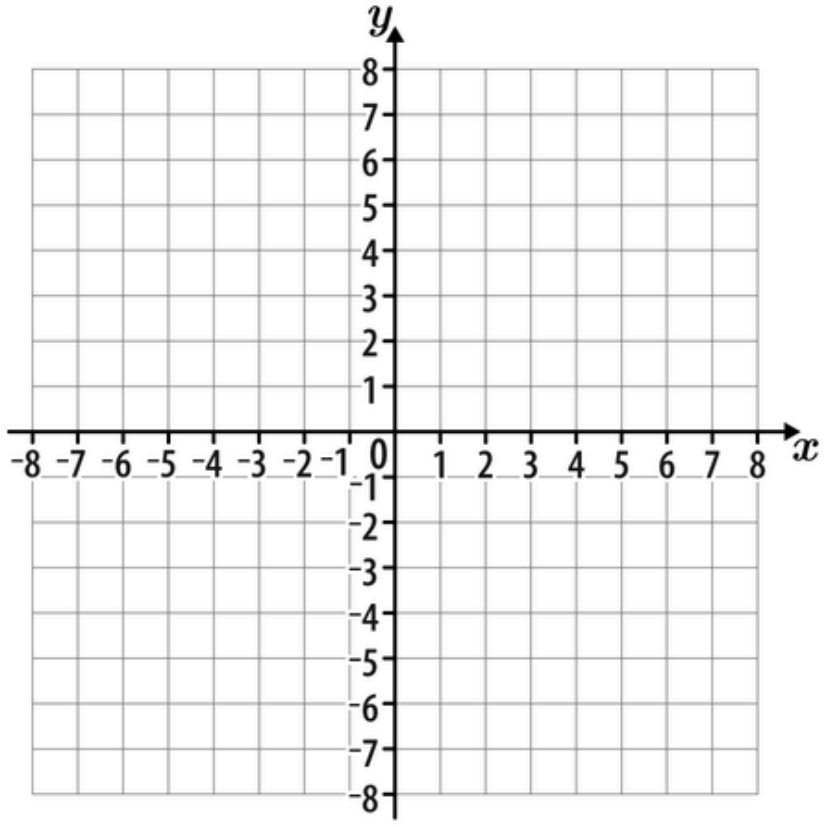


Q4

M932

By first filling in the table for $y = x + 4$, draw the graph of $y = x + 4$.

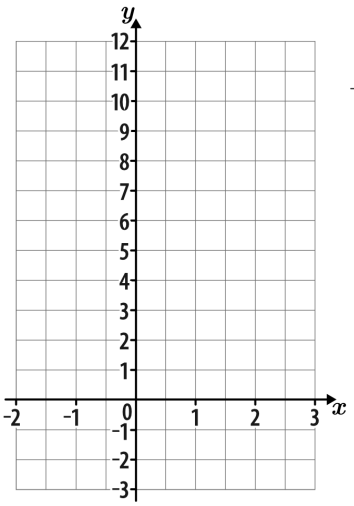
x	-2	-1	0	1	2
y		3	4		6



Q5

M932

By first filling in the table for $y = 2x + 5$, draw the graph of $y = 2x + 5$.

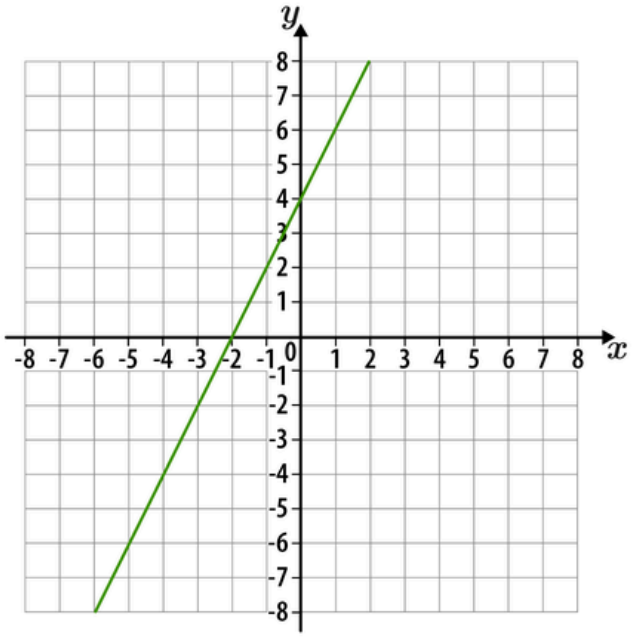


x	-2	-1	0	1	2
y				7	9

Q6

M544

A straight line is shown on the coordinate grid below.



a) What is the y-intercept of this line?

Answer: .....

b) What is the gradient of this line?

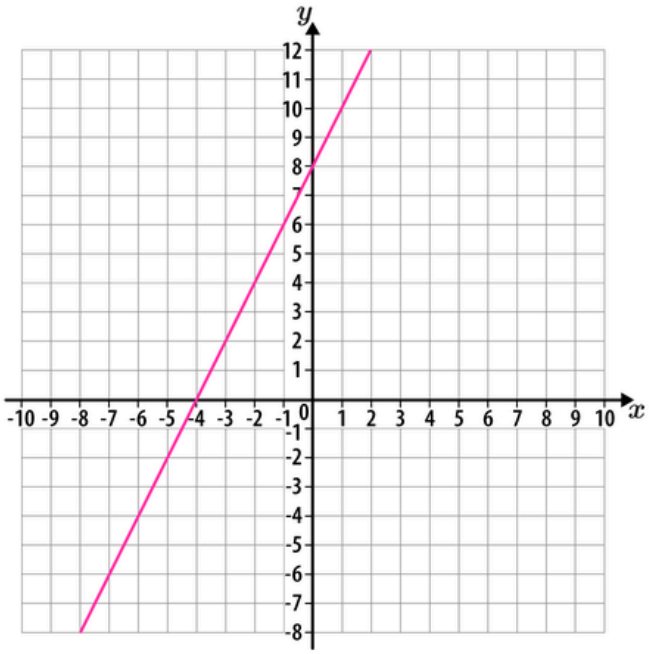
Answer: .....

Q7

M544

What is the equation of the straight line shown below?

Give your answer in the form $y = mx + c$, where m and c are integers or fractions in their simplest forms.



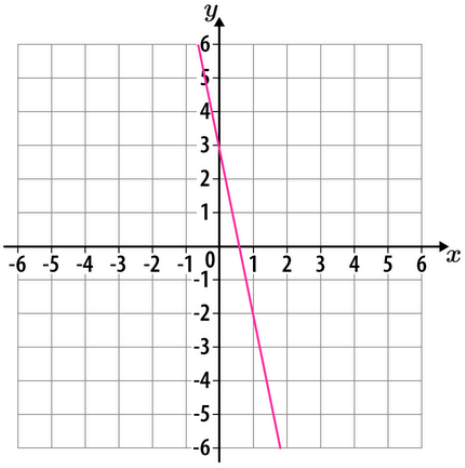
Answer: .....

Q8

M544

Work out the equation of the straight line shown below.

Give your answer in the form $y = mx + c$, where m and c are integers or fractions in their simplest forms.



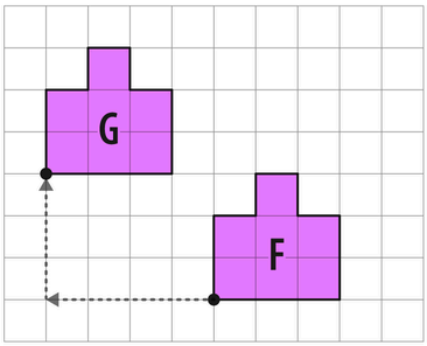
Answer: .....

Q1

M139

Complete the sentence below to describe the translation that maps shape F onto shape G.

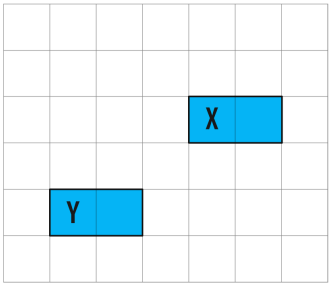
Shape F moves ☐ square(s) to the left and ☐ square(s) up.



Q2

M139

Describe fully the transformation of shape X to shape Y

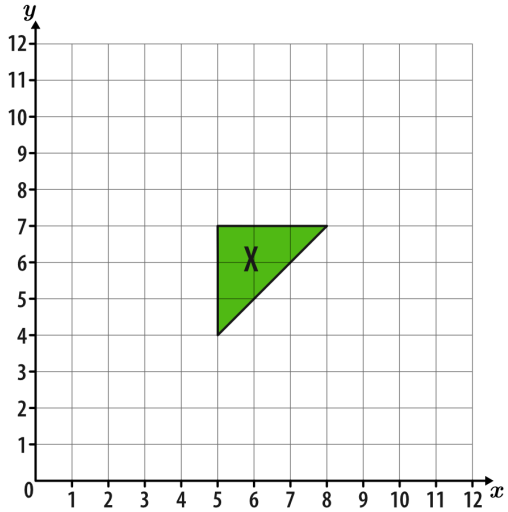


Answer: .....

Q3

M139

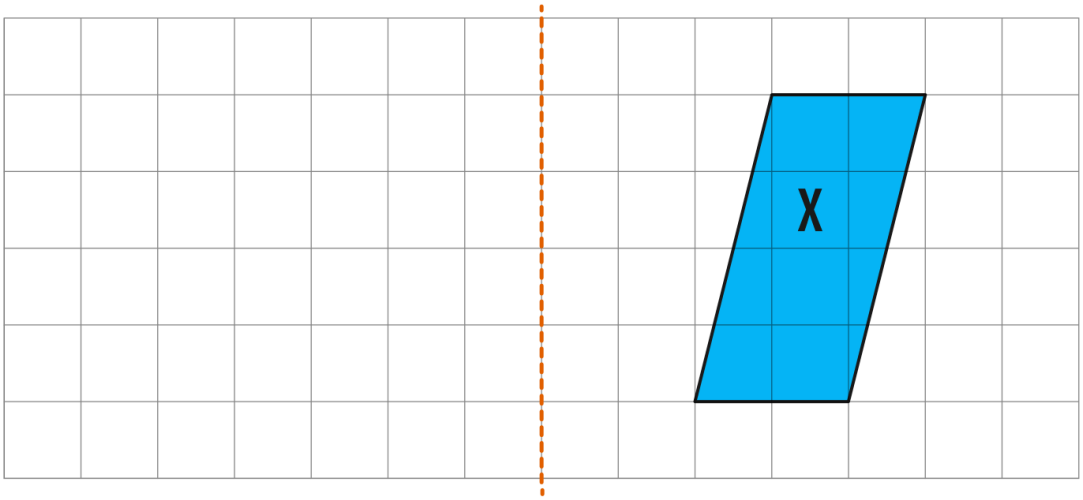
Translate shape X by 4 units to the right and 1 unit down.



Q4

M290

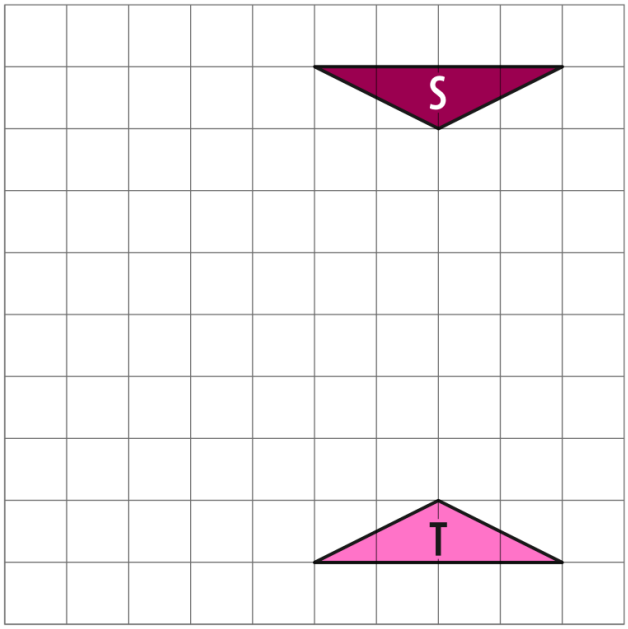
Reflect shape X in the dashed line.



Q5

M290

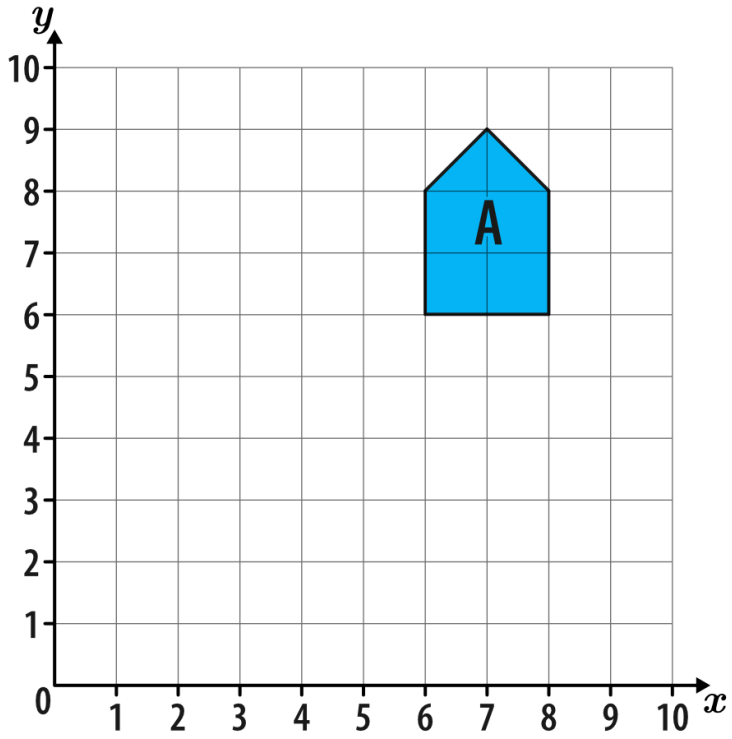
Draw the line of reflection which transforms triangle S onto triangle T.



Q6

M290

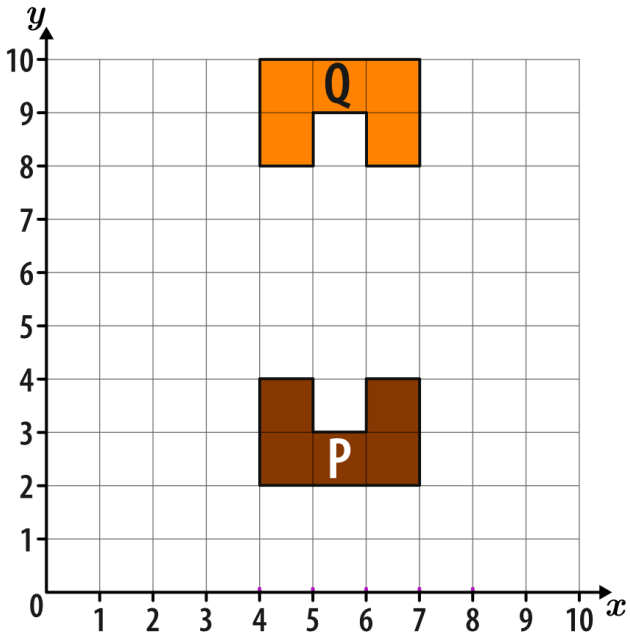
Reflect shape A in the line $x = 5$.



Q7

M290

Describe fully the transformation from shape P to shape Q.



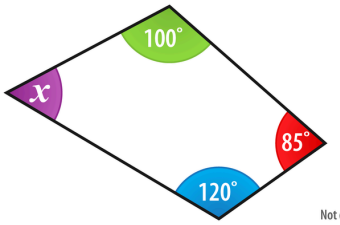
Answer: .....

Finding unknown angles

Q1

M679

Find the size of angle x.



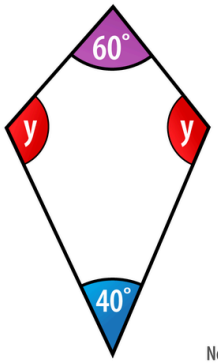
Not drawn accurately

Answer: ..... °

Q2

M679

What is the size of angle y in the quadrilateral below?



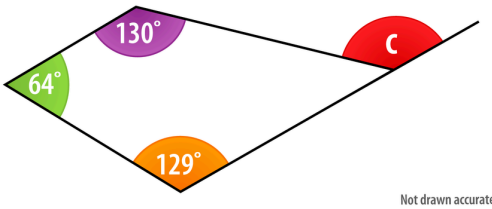
Not to scale

Answer: ..... °

Q3

M319

Find the value of angle c.

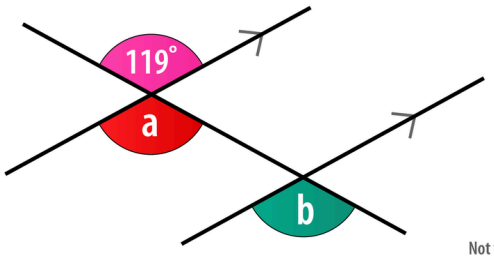


Not drawn accurately

Answer: ..... °

Q4

M606



Not to scale

a) Work out the size of angle a. Give a reason for your answer.

Answer: .....

.....

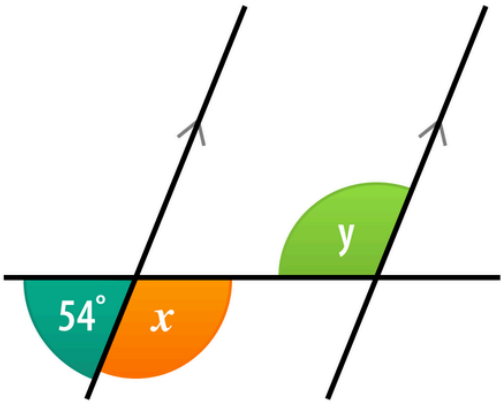
b) Work out the size of angle b. Give a reason for your answer.

Answer: .....

.....

Q5

M606



Not drawn accurately

a) What is the size of angle x? Give a reason for your answer.

Answer: .....

.....

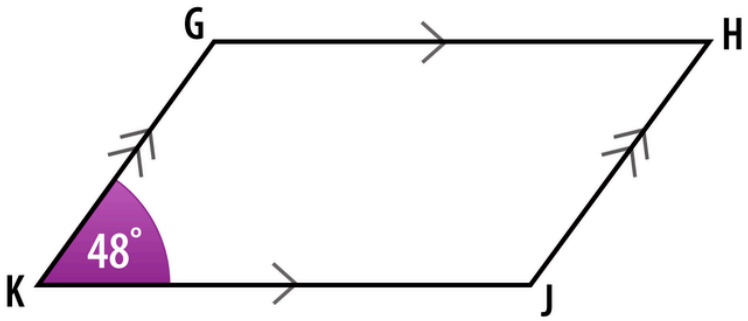
b) Which angle fact shows that angle x and angle y are equal?

Answer: .....

Q6

M393

Look at the parallelogram below.
Work out the size of angle KGH.

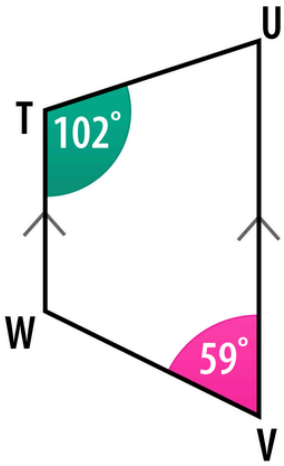


Not drawn accurately

Answer: ..... °

Q7

M393



Not drawn accurately

a) Work out the size of angle TUV

Answer: ..... °

b) Work out the size of angle VWT

Answer: ..... °

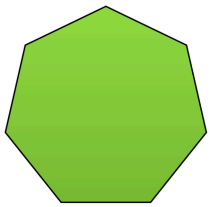
Q8

M653

The total, T, of the interior angles of a polygon with n sides is given by

$T = 180° \times (n - 2)$

Calculate the total of the interior angles of this heptagon.



Answer: ..... °

Q9

M653

A regular polygon has 18 sides.

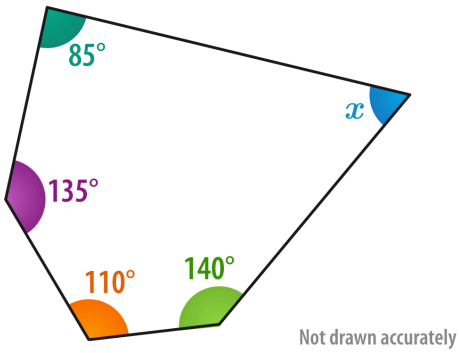
What is the size of each of its **interior** angles?

Answer: ..... °

Q10

M653

A polygon is shown below.



a) Work out the sum of its interior angles.

Answer: ..... °

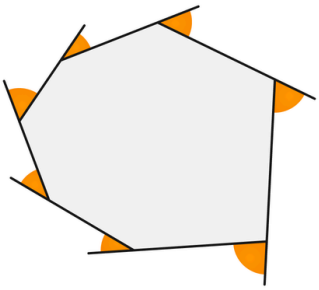
b) Work out the size of angle x.

Answer: ..... °

Q11

M653

The **exterior** angles of a heptagon are marked on the diagram below.
What is the sum of these angles?



Answer: ..... °

Q12

M653

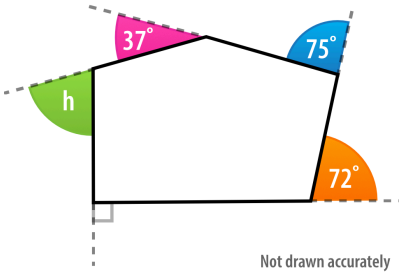
What is the size of each of the exterior angles in a regular 12-sided polygon?

Answer: ..... °

Q13

M653

An irregular pentagon is shown below.
Calculate the size of the angle marked h.



Answer: ..... °

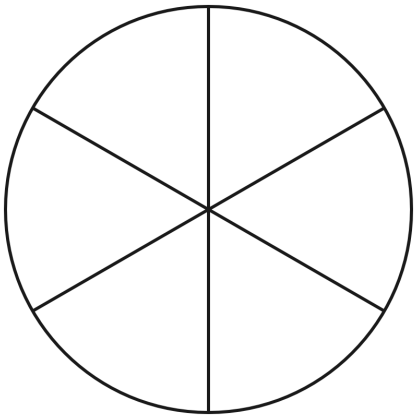
Q1

M574

The table shows information about the pets of some students.

	No pets	1 pet	2 or more pets
Frequency	2	4	6

Use the diagram below to draw and label a pie chart to show this information.



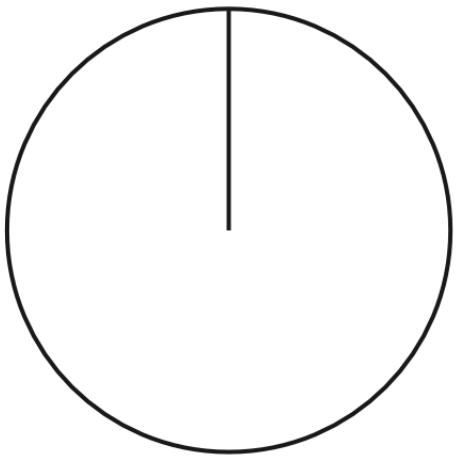
Q2

M574

The colour of 30 people's hair was recorded in a survey.

Draw a pie chart to show the following results from the survey.

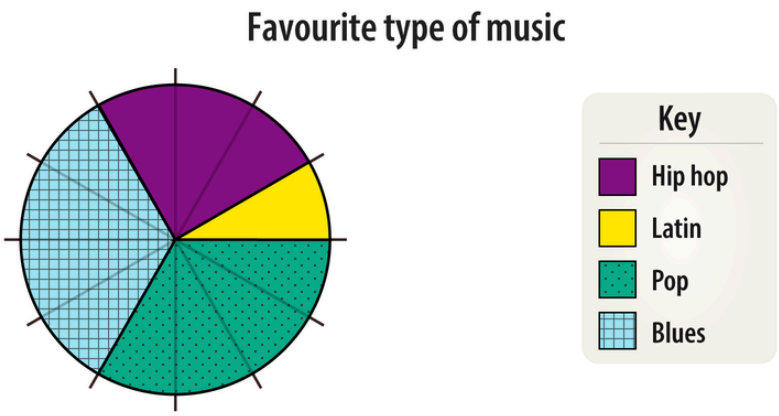
Hair colour	Brown	Ginger	Blonde
Frequency	15	8	7



Q3

M165

This pie chart shows the results of a survey about people's favourite types of music.



a) Which type of music was chosen by the **fewest** people?

Answer: .....

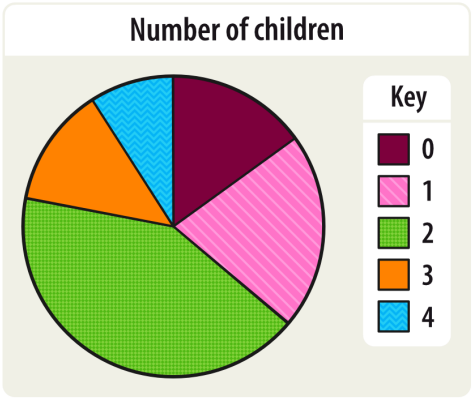
b) What **fraction** of the people chose this type of music? Give your answer in its simplest form.

Answer: .....

Q4

M165
U854

This pie chart shows how many children some of Francesca's friends have.
What was the modal response?

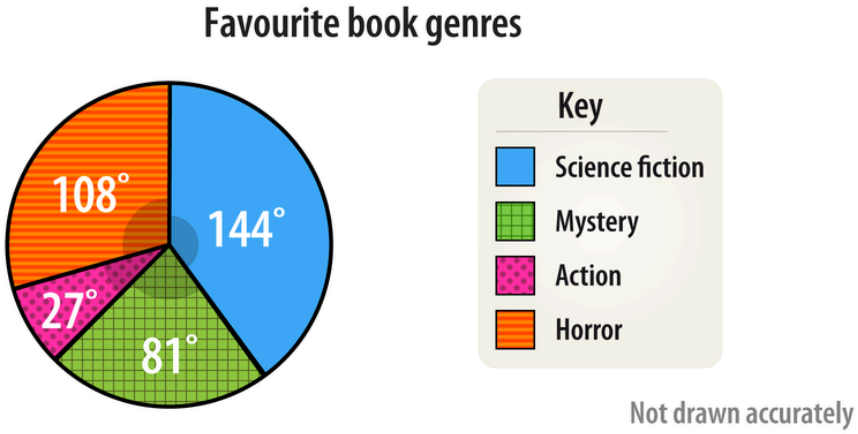


Answer: .....

Q5

M165

40 people answered a survey about their favourite book genres.
How many people said **action**?

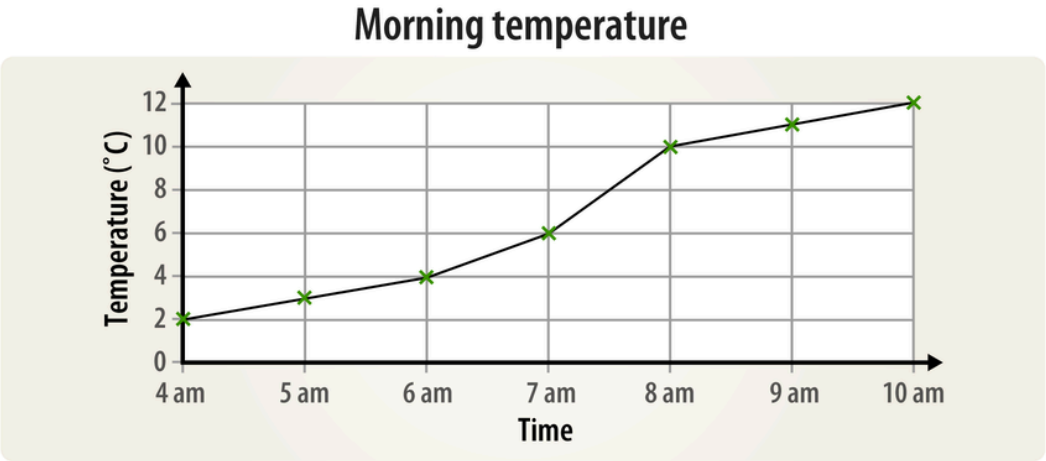


Answer: .....

Q6

M183

What was the temperature at **7 am**?

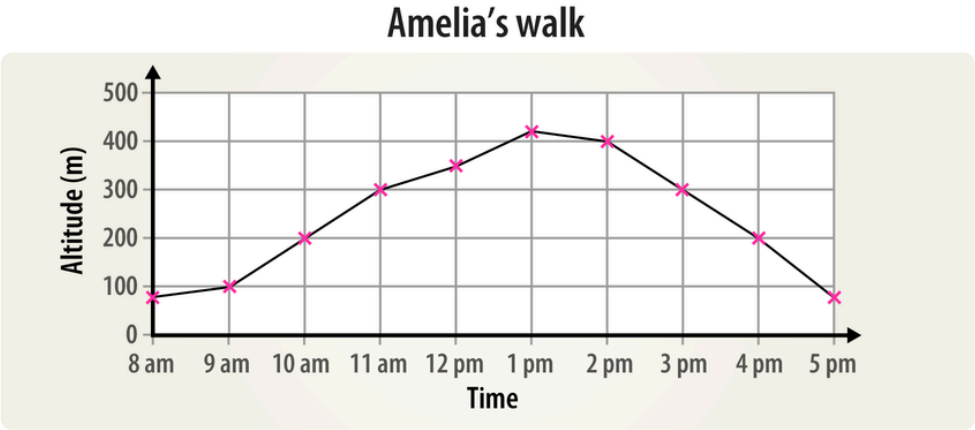


Answer: ..... °C

Q7

M183

This line graph shows how Amelia's altitude changed during her walk.
Write down the **two** times that her altitude was recorded as $200\ \text{m}$.

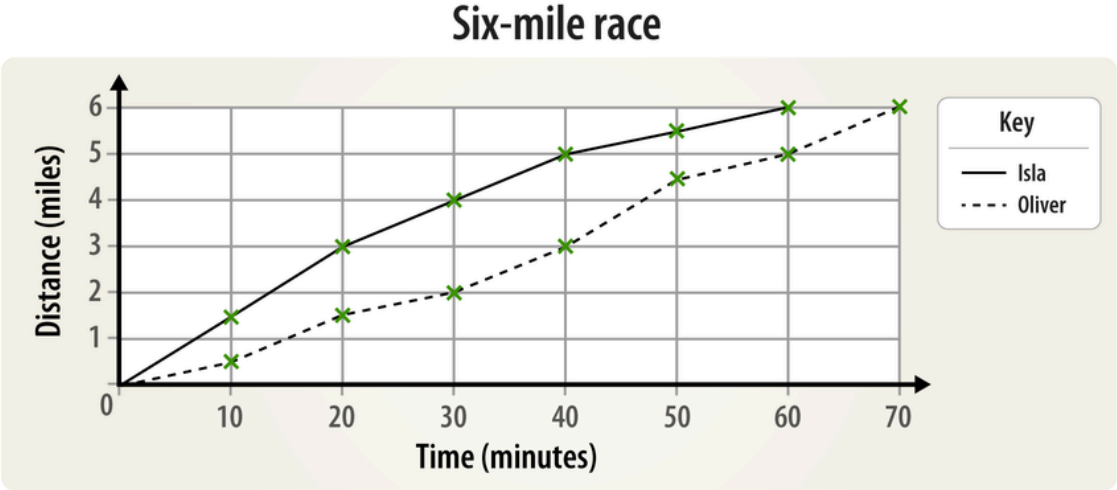


Answer: ..... and .....

Q8

M183

The line graph shows the progress of two people in a six-mile race.
How far had Isla travelled after $30\ \text{minutes}$?

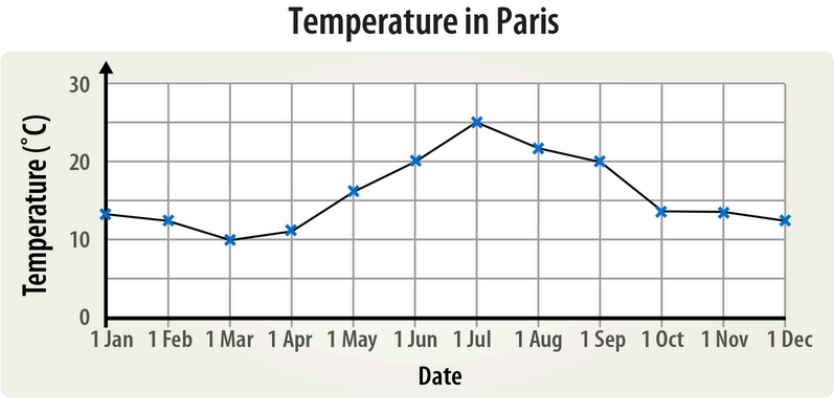


Answer: ..... miles

Q9

U854
M183

What was the **range** of the recorded temperatures in Paris?



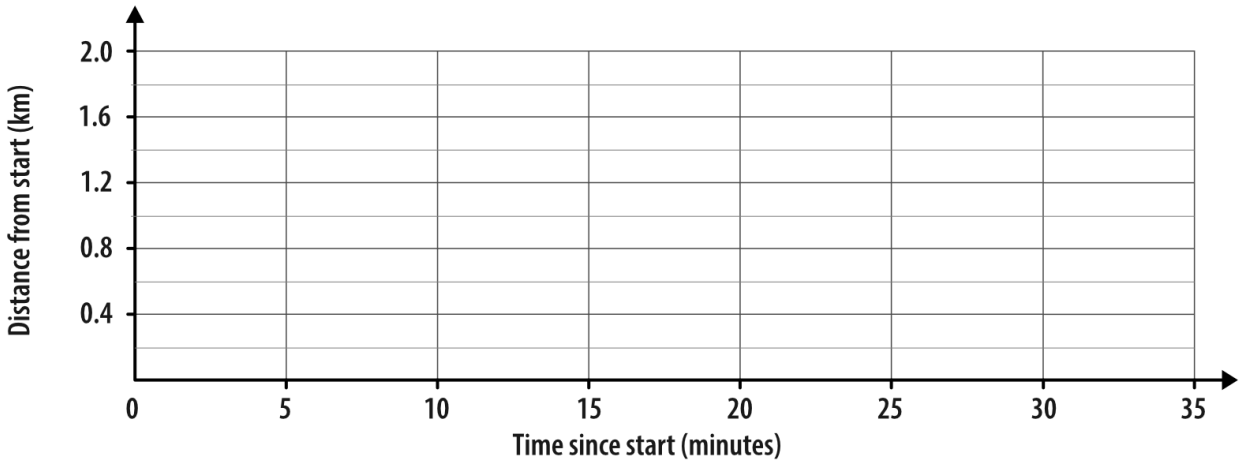
Answer: ..... °C

Q10

M140

Use the axes below to draw a line graph of the information displayed in the table.

Time since start (minutes)	Distance from start (km)
0	0
5	0.3
10	0.8
15	1.4
20	1.9
25	1.5
30	1.6
35	0.7



Q11

M648

The number of people visiting a cafe each day for 14 days is listed below.
This information is displayed in the stem-and-leaf diagram.
Fill in the missing row of the stem-and-leaf diagram.

Number of people			
102	115	91	113
94	105	97	116
93	110	99	118
104	101		

Number of visitors in a cafe for 14 days

9	1 3 4 7 9
10	1 2 4 5

Key	
9|1	represents 91 people

Q12

M648

The times taken for 13 people to solve a puzzle are listed below.
Draw an ordered stem-and-leaf diagram to represent this data.

Time (minutes)				
8	7	20	24	10
15	14	10	8	16
12	24	29		

Q13

M210
U854

This stem-and-leaf diagram shows the birth weights of 18 babies.
What is the **modal** weight?

Birth weights

2	7 7
3	1 2 4 4 6 8 8 9
4	2 3 5 5 5 7
5	0 1

Key: 2 | 7 represents 2.7 kg

Answer: _____ kg

Q14

M210
U854

This stem-and-leaf diagram shows the heights of some students in Year 8.
What is the **range** of their heights?

Heights of Year 8 students

13	0
14	4 5 6 6 7 7
15	1 2 2 3 4 5 8 9
16	6 7

Key: 14 | 5 represents 145 cm

Answer: _____ cm

Q15

M210
U854

This stem-and-leaf diagram shows the heights of 9 giraffes living in a zoo.
What is the **median** height?

Heights of giraffes

1	7
2	9
3	1 1 4 7
4	
5	0 6 8

Key: 1 | 7 represents 1.7 m

Answer: _____ m

Q1

M384

Decide whether $>$ or $<$ should go in each of the boxes to complete the statements below.

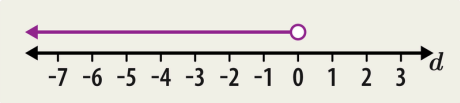
a) 3 ☐ 8

b) 2 ☐ −10

Q2

M384

Write down the inequality shown on the number line below.

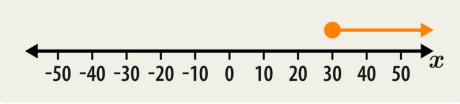


Answer: .....

Q3

M384

Write down the inequality shown on the number line below.

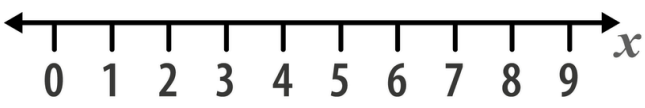


Answer: .....

Q4

M384

Draw the inequality $x \leq 4$ on the number line.



Q5

M118

Solve $a + 5 \geq 9$

Answer: .....

Q6

M118

Solve $3x \leq -12$

Answer: .....

Q7

M118

Solve the following inequality:

$3y + 8 \geq 23$

Answer: .....

Q8

M118

Solve the following inequality:

$9 + \frac{w}{3} \leq 15$

Answer: .....

Double brackets

Q1

M960

Expand and simplify $(m+9)(m+2)$

Answer: .....

Q2

M960

Expand and simplify $(x+6)(x-2)$

Answer: .....

Q3

M960

Expand and simplify $(2x+3)(x+7)$

Answer: .....

Q4

M960

Expand and simplify $(x-4)(3x+8)$

Answer: .....

Double brackets

Q5

M960

Expand and simplify $(5 + t)(4t + 9)$

Answer: .....

Q6

M960

Expand and simplify $(n - 4)(n - 8)$

Answer: .....

Q7

M960

Expand and simplify $(7 - m)(3m + 5)$

Answer: .....

Q8

M960

Expand and simplify $(5x + 6)^2$

Answer: .....

Q1

M645

Work out $\frac{5}{8} - \frac{3}{8}$

Give your answer as a fraction in its simplest form.

Answer: .....

Q2

M645

Work out $\frac{7}{35} + \frac{9}{35} + \frac{4}{35}$

Give your answer as a fraction in its simplest form.

Answer: .....

Q3

M645

Work out $\frac{2}{5} \times \frac{6}{7}$

Give your answer as a fraction in its simplest form.

Answer: .....

Q4

M645

What is $\frac{5}{2} \div \frac{8}{9}$?

Give your answer as a fraction in its lowest terms.

Answer: .....

Q5

M619

Work out $3\frac{4}{9} - 1\frac{2}{9}$

Give your answer as a whole number or as a mixed number in its simplest form.

Answer: .....

Q6

M619

Work out $2\frac{3}{8} + 1\frac{2}{4}$

Give your answer as a mixed number.

Answer: .....

Q7

M619

Work out $\frac{1}{11} \times 1\frac{7}{8}$

Give your answer as a fraction in its simplest form.

Answer: .....

Q8

M619

Work out $5\frac{1}{2} \div \frac{3}{7}$

Give your answer as a fraction in its simplest form.

Answer: .....

Q1
M754

Fully simplify $\frac{2(m+11)}{10m}$

Answer: .....

Q2
M754

Write $\frac{9x+15}{12x}$ as a fraction in its simplest form.

Answer: .....

Q3
M754

Write the fraction below in its simplest form.

$\frac{3p^2+12p}{21p}$

Answer: .....

Q4
M754

Fully simplify $\frac{21c+18}{8(7c+6)}$

Answer: .....

Q5

M336

Fully simplify the expression below.

$\frac{d}{12} + \frac{3d}{12}$

Answer: .....

Q6

M336

Write $\frac{x}{4} + \frac{5}{8}$ as a single fraction in its simplest form.

Answer: .....

Q7

M336

Write $\frac{7a}{2} - \frac{4}{3}$ as a single fraction in its simplest form.

Answer: .....

Q8

M336

Write $\frac{7x+13}{2} + \frac{4x+5}{2}$ as a single fraction in its simplest form.

Answer: .....

Q1
M701

Write the recurring decimal below using dot notation.
$0.333333...$

Answer: .....

Q2
M701

Fill in the first five digits after the decimal point when $0.37\dot{2}$ is written out in full.

$$0.37\dot{2} = 0.\ \_\ \_\ \_\ \_\ \_ \ldots$$

Q3
M701

Write the recurring decimal below using dot notation.
$0.271271...$

Answer: .....

Q4
M922

Write $\frac{2}{11}$ as a recurring decimal using dot notation.

Answer: .....

Q5
M922

Write $\frac{135}{11}$ as a recurring decimal using dot notation.

Answer: .....

Q1

M797

A square is drawn on a coordinate grid.
One side lies on the line $y = 3$, another on the side $y = 7$ and another on the side $x = 8$.
There are **two** lines that the final side could lie on.
Work out the equation of each line.

Answer: _____ or _____

Q2

M384

Six inequalities are shown below.
Choose **all** of the inequalities for which 6 is the lowest integer value that x could take.

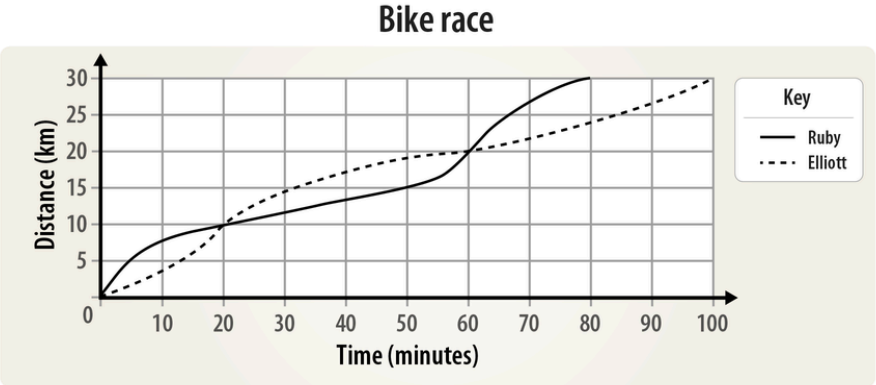
$x \leq 6$ $x < 6$ $x < 7$
$x > 5$ $x \geq 6$ $x > 6$

Answer: _____

Q3

M183

Use the line graph to work out how many minutes Elliot was ahead of Ruby for in the bike race.



Answer: _____

Q4

M139

Point $\mathrm{P}\ (7, 1)$ is translated to $\mathrm{P}'\ (4, 5)$.
Describe the translation

Answer: .....

.....

Q5

M118

Poppy has tried to solve $x^2 \geq 4$. Her working is shown below.
Find a value of x which shows that Poppy's answer is incorrect.

Answer: .....

Q6

M701

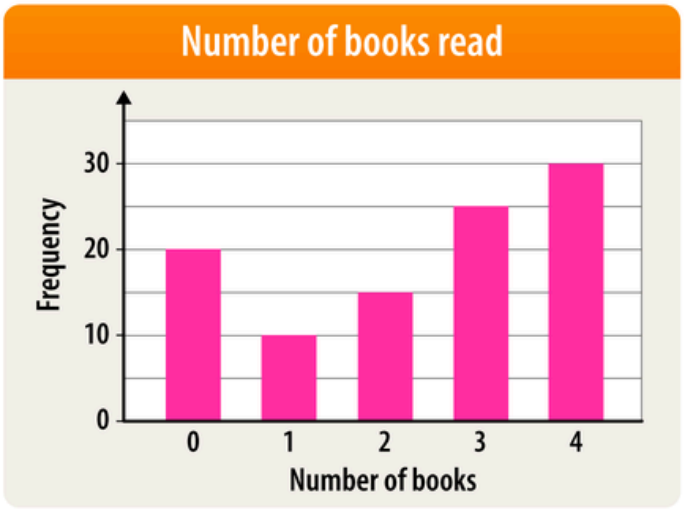
Round $0.\dot{2}\dot{6}$ to 3 decimal places.

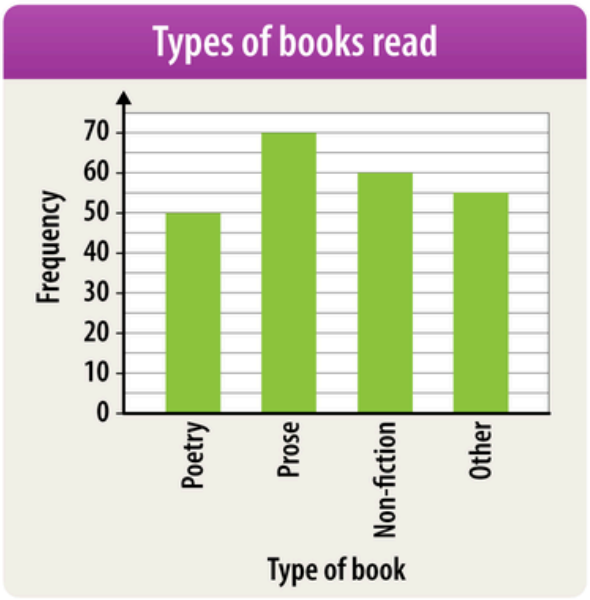
Answer: .....

Q7

U854

Each of the students in Year 12 recorded how many books they read last month and the types of books they read. This information is shown in the bar charts below.





a) Find the median **number** of books read **or** state that it is impossible to do so.

Answer: .....

b) Find the median **type** of book read **or** state that it is impossible to do so.

Answer: .....

c) Is it possible to calculate the modal **number** of books read and the modal **type** of book read? Write a sentence to explain your answer.

Answer: .....

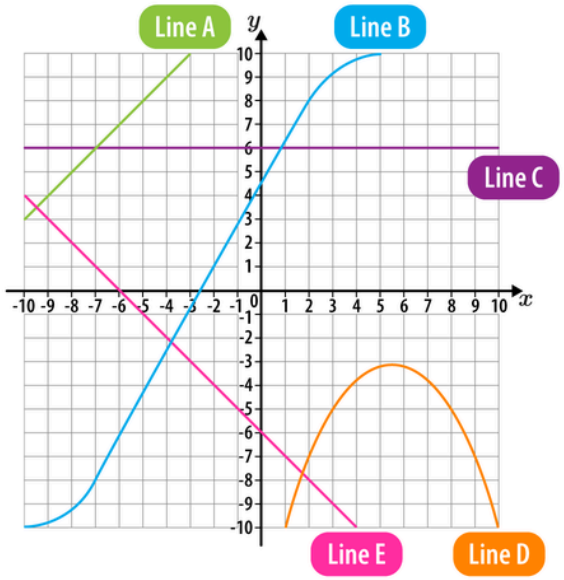
.....

Q8

M544

Five different lines are shown below.

Choose all the lines shown for which it is possible to write their equations in the form $y = mx + c$, where m and c are numbers.



Answer: .....

Q9

M619

Work out the **range** of the following values. Give your answer as an improper fraction in its simplest form.

$\frac{27}{10}$, $2\frac{4}{5}$, $1\frac{7}{10}$, $\frac{9}{5}$

Answer: .....

Q10

M393

Kelly draws a quadrilateral that has two pairs of equal-length sides and only one pair of equal-sized angles.

Which one of the words below describes the quadrilateral that she has drawn?

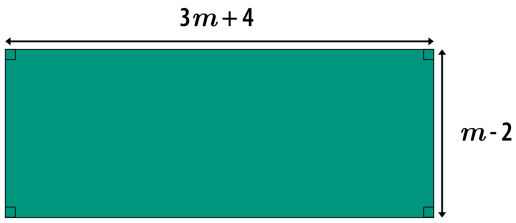
Rectangle **Parallelogram** **Rhombus** **Kite** **Trapezium**

Answer: .....

Q11

M960

Write an expression for the area of this rectangle.
Your expression should not have any brackets and be written as simply as possible.

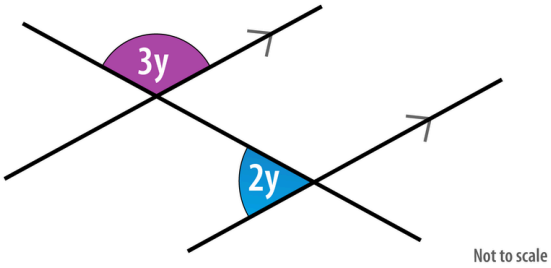


Answer: .....

Q12

M606

Find the value of y.



Answer: ..... °

Q13

M210

The stem-and-leaf diagrams below show the speed of some cars before and after some speed bumps were built on a road.
By how much did the **median** speed **decrease** after the speed bumps were built?

Before	
1	8
2	9
3	1 3 6 9
4	1 2 2

After	
1	7
2	3 5 8 9
3	4 4 7
4	0

Key
1 | 7 represents 17 mph

Answer: ..... mph

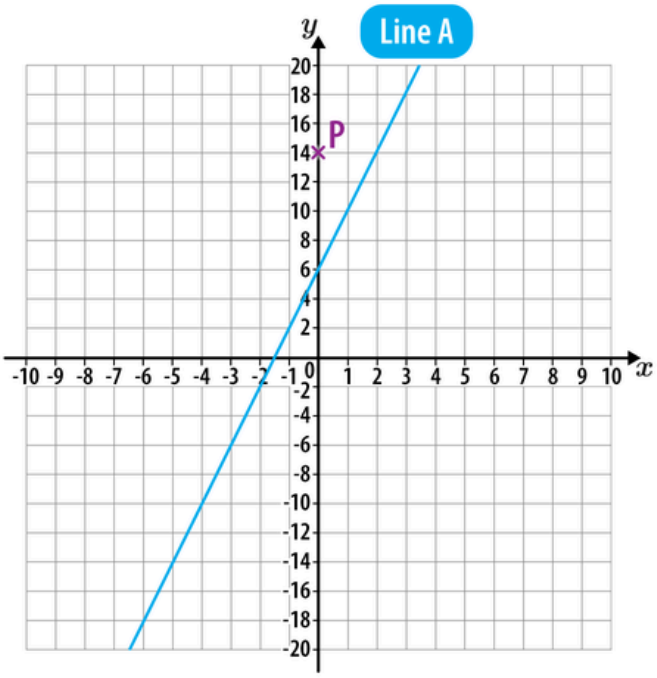
Q14

M544

The graph below shows line A and point P. Work out the equation of the straight line that is parallel to line A and passes through point P.

Give your answer in the form $y = mx + c$, where m and c are integers or fractions in their simplest forms.

(Hint: **parallel** lines have the same **gradient**.)



Answer: _____

Q15

M606

A laser is pointed down an optical fibre (glass wire) that has parallel sides. Light always bounces off the sides at the same angle that it hits them at.

What is the size of angle x?

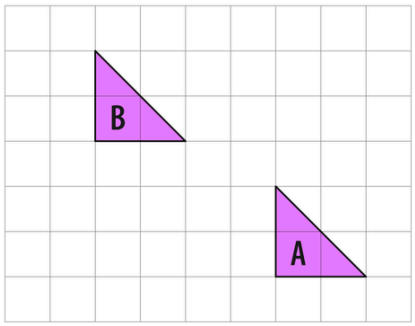
Not drawn accurately

Answer: _____ °

Q16

M139

Is it possible to map shape A onto shape B using the translations below?
You can use each translation any number of times.
Write a sentence to explain your answer.



Translation 1
2 squares right and 1 square down

Translation 2
3 squares left and 2 squares up

Answer: _____

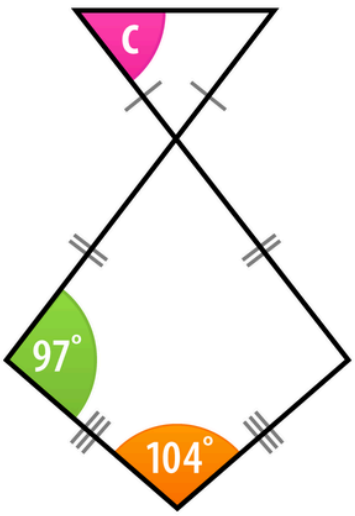
_____

_____

Q17

M393

Olivia draws five straight lines to form a shape consisting of a kite and an isosceles triangle.
Work out the size of the angle marked c.



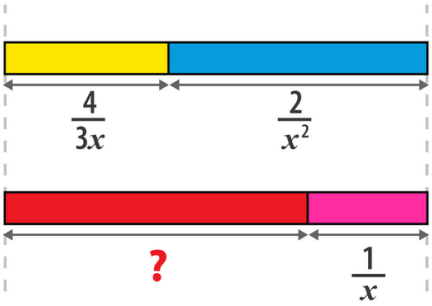
Not drawn accurately

Answer: _____ °

Q18

M336

The two poles below have exactly the same length. What expression should replace the question mark? Give your answer as a single fraction in its simplest form.

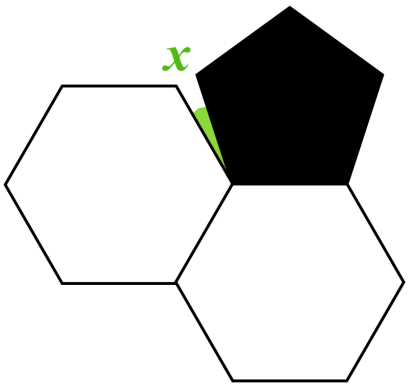


Answer: .....

Q19

M653

The shape below is part of a football that has been unstitched and laid flat. It is made up of one regular pentagon and two regular hexagons.
What is the size of angle x?



Not drawn accurately

Answer: ..... °

Q20

M574

In a survey, 80 people were asked where they would most like to travel.
40% of people said Asia, $\frac{1}{4}$ of people said Africa, 16 people said Europe, and the rest said Australia.
On a pie chart showing this information, what would be the central angle for the section showing those that said Australia?

Answer: ..... °

Q21

M653

Alastair draws a regular polygon with n sides.
Each of its exterior angles is greater than $13°$.
What is the largest value n could be?

Answer: .....

Q22

M754

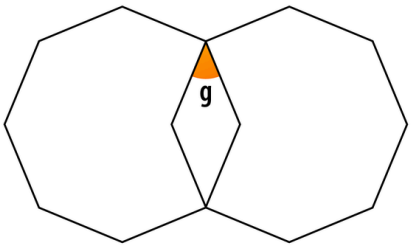
There are $12f + 36$ raffle tickets in a box, of which $5f + 15$ are winning tickets.
Shaun picks a raffle ticket out of the box at random.
What is the probability that his ticket is a winning ticket?
Give your answer as a fraction in its simplest form.

Answer: .....

Q23

M653

Two identical, overlapping, regular 8-sided polygons are shown below.
Calculate the size of the angle marked g.

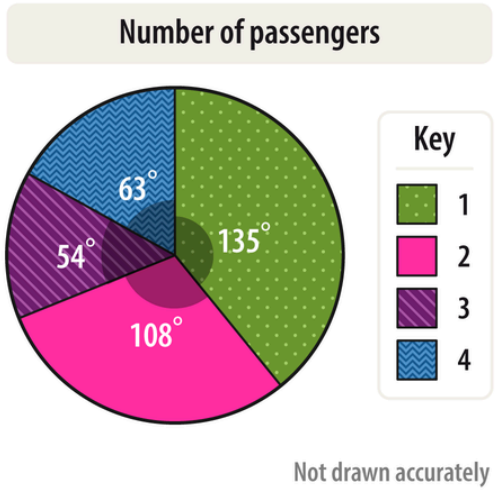


Answer: ..... °

Q24

U854

A taxi driver recorded the number of passengers in their taxi on every trip for a month. The taxi driver made a total of n trips. The pie chart below shows the results.



Work out the mean number of passengers per trip. Give your answer to 2 d.p.

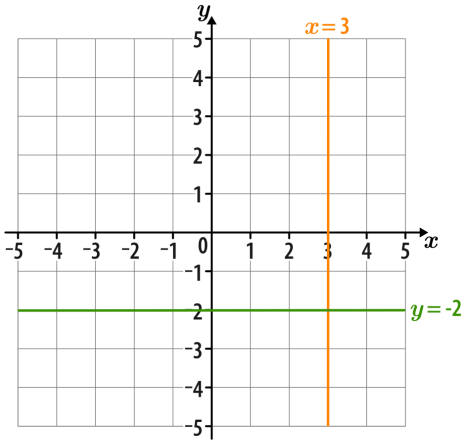
Answer: .....

Plotting graphs and finding equations

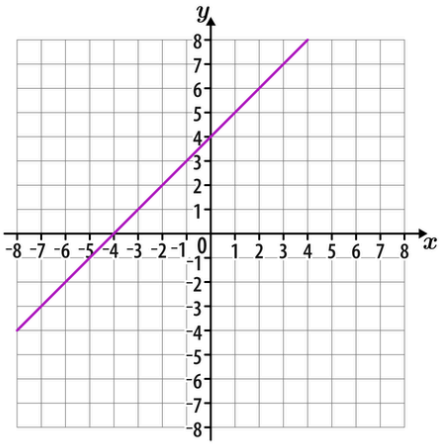
Q1 $x = 14$

Q2 $y = -4$

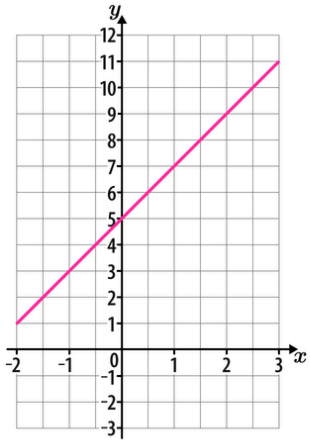
Q3



Q4



Q5



Q6 a) y-intercept $= 4$

b) gradient $= 2$

Q7 $y = 2\,x + \ 8$

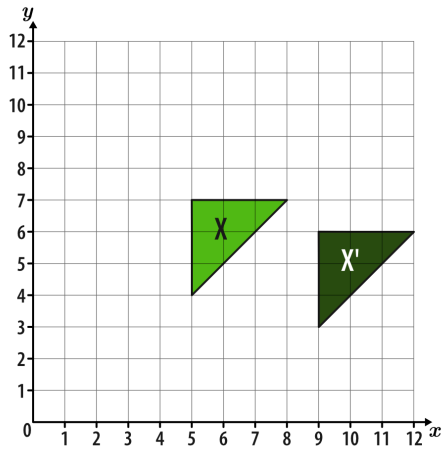
Q8 $y = -5\,x + \ 3$

Transforming shapes

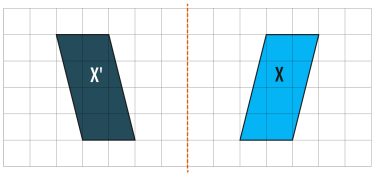
Q1 Shape F moves 4 square(s) to the left and 3 square(s) up.

Q2 Shape X has been translated 3 squares to the left and 2 squares down.

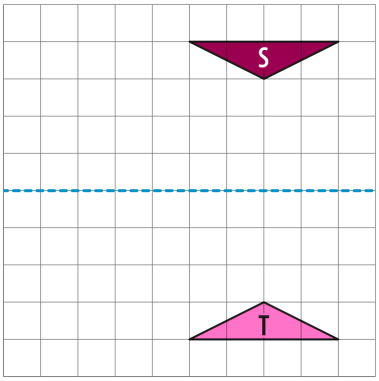
Q3



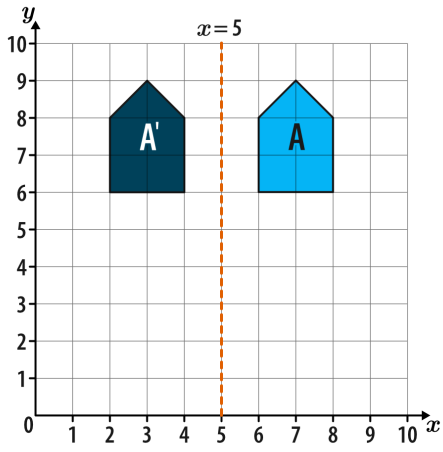
Q4



Q5



Q6



Q7 Reflection in the line $y = 6$

Finding unknown angles

Q1 $55\ ^\circ$

Q2 $130\ ^\circ$

Q3 $143\ ^\circ$

Q4 a) $a = 119\ ^\circ$

Vertically opposite angles are equal

b) $b = 119\ ^\circ$

Corresponding angles are equal

Q5 a) $x = 126\ ^\circ$

Angles which make a straight line sum to 180°

b) Alternate angles are equal

Q6 $132\ ^\circ$

Q7 a) $78\ ^\circ$

b) $121\ ^\circ$

Q8 $900\ ^\circ$

Q9 $160\ ^\circ$

Q10 a) $540\ ^\circ$

b) $70\ ^\circ$

Q11 $360\ ^\circ$

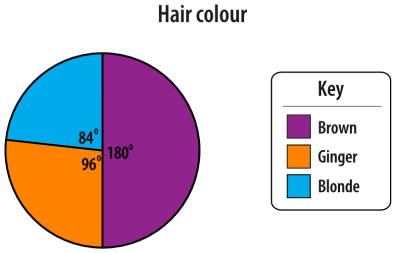
Q12 $30\ ^\circ$

Q13 $86\ ^\circ$

Drawing and interpreting statistical diagrams

Q1

Q2



Q3 a) Latin

b) $\frac{1}{12}$

Q4 2

Q5 3

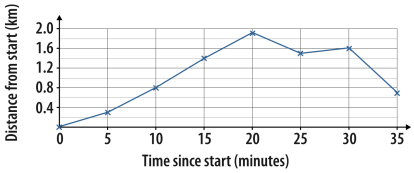
Q6 6 °C

Q7 4 pm and 10 am

Q8 4 miles

Q9 15 °C

Q10



Q11

11	0 3 5 6 8

Q12

Times taken to solve a puzzle

0	7 8 8
1	0 0 2 4 5 6
2	0 4 4 9

Key: 0|7 represents 7 minutes

Drawing and interpreting statistical diagrams

Q13 4.5 kg

Q14 37 cm

Q15 3.4 m

Linear inequalities

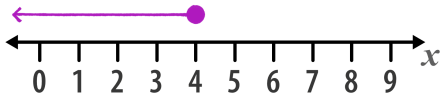
Q1 a) $3 < 8$

b) $2 > -10$

Q2 $d < 0$

Q3 $x \geq 30$

Q4



Q5 $a \geq 4$

Q6 $x \leq -4$

Q7 $y \geq 5$

Q8 $w \leq 18$

Answers

Double brackets

Q1 $m^2 + 11m + 18$

Q2 $x^2 + 4x - 12$

Q3 $2x^2 + 17x + 21$

Q4 $3x^2 - 4x - 32$

Q5 $4t^2 + 29t + 45$

Q6 $n^2 - 12n + 32$

Q7 $-3m^2 + 16m + 35$

Q8 $25x^2 + 60x + 36$

Algebraic fractions

Q1 $\frac{m+11}{5m}$

Q2 $\frac{3x+5}{4x}$

Q3 $\frac{p+4}{7}$

Q4 $\frac{3}{8}$

Q5 $\frac{d}{3}$

Q6 $\frac{2x+5}{8}$

Q7 $\frac{21a-8}{6}$

Q8 $\frac{11x+18}{2}$

Fractions review

Q1 $\frac{1}{4}$

Q2 $\frac{4}{7}$

Q3 $\frac{12}{35}$

Q4 $\frac{45}{16}$

Q5 $2\frac{2}{9}$

Q6 $3\frac{7}{8}$

Q7 $\frac{15}{88}$

Q8 $\frac{77}{6}$

Fractions and recurring decimals

Q1 $0.\dot{3}$

Q2 $0.37\dot{2} = 0.\underline{3}\,\underline{7}\,\underline{2}\,\underline{2}\,\underline{2}\ldots$

Q3 $0.\dot{2}7\dot{1}$

Q4 $0.\dot{1}\dot{8}$

Q5 $12.\dot{2}\dot{7}$

Mixed Questions

Q1 $x = 4$ or $x = 12$

Q2 $x > 5$ $x \geq 6$

Q3 40

Q4 3 units to the left and 4 units up

Q5 Any value of x less than or equal to -2

Q6 0.263

Q7 a) 3

b) It is impossible to find the median type

c) It is possible. The mode can be used for both quantitative data, such as the number of books read, and qualitative data, such as the type of book read.

Q8 Line A Line C Line E

Q9 $\frac{11}{10}$

Q10 Kite

Q11 $3m^2 - 2m - 8$

Q12 $36\ ^\circ$

Q13 $7\ \mathrm{mph}$

Q14 $y = 4\ x + 14$

Q15 $41\ ^\circ$

Q16 It is possible because performing translation 2 twice and translation 1 once will map shape A onto shape B.

Q17 $59\ ^\circ$

Q18 $\frac{x+6}{3x^2}$

Q19 $12\ ^\circ$

Q20 $54\ ^\circ$

Q21 27

Q22 $\frac{5}{12}$

Q23 $45\ ^\circ$

Q24 2.13