1 (a) Write 40 : 2000 as a ratio in its simplest form.

(a) ..... : ..... [2]

(b) Divide 350 in the ratio 1 : 6.

(b) .... [2]

(c) Find 20% of 450.

(c) ..... [2]

Same as Q1 on draft spec

2 Write these in order, smallest first.

0.34 $\frac{1}{3}$ 3.5%

.... [2]

smallest

Same as Q2 on draft spec

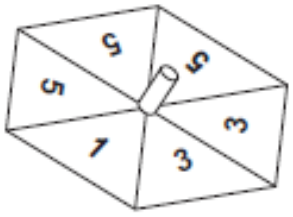
3 Colin drinks $\frac{3}{8}$ of a litre of milk each day.
Milk costs 89p for a 2 litre carton and 49p for a 1 litre carton.

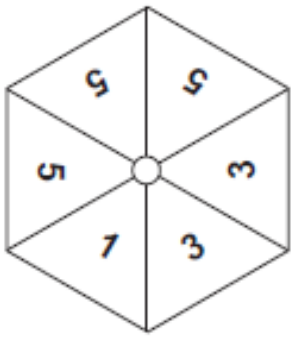
What is the smallest amount that Colin would have to spend to buy milk for one week?
Show your working.

Same as Q3 on draft spec

£ ..... [3]

4 A spinner is shown below.
Each section on the spinner is the same size.





(a) Write a number to make each sentence true.

(i) It is **evens** that the spinner will land on number ..... . [1]

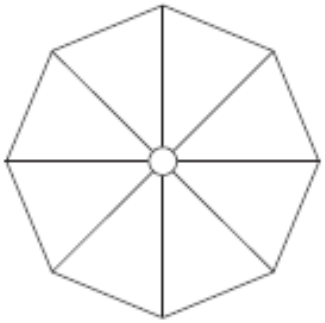
(ii) There is probability of $\frac{1}{6}$ that the spinner will land on number ..... . [1]

(iii) It is **impossible** that the spinner will land on number ..... . [1]

(b) The spinner below has the following properties.

- There are eight equal sections, each showing one number
- There are three different numbers on the spinner
- The probability of the spinner landing on an even number is greater than the probability of it landing on an odd number
- It is more likely that the spinner will land on a 6 than either of the other numbers.

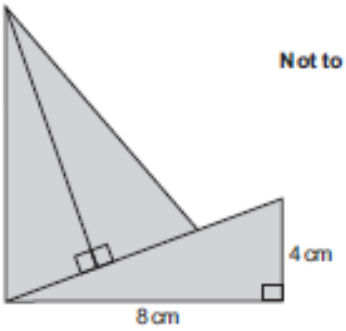
Write a possible set of numbers on the spinner.



Same as Q4 on draft spec

[3]

5 A shape is made from three congruent right-angled triangles, as shown in the diagram.

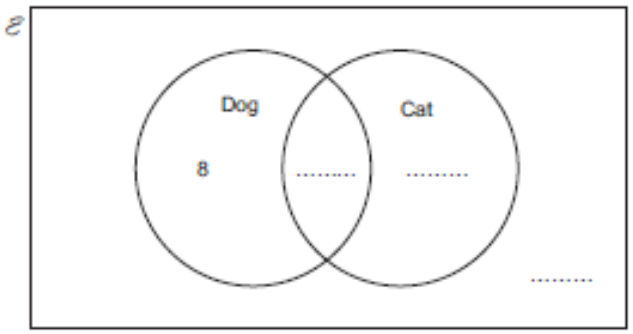


Find the total area of the shape.

NEW

..... cm^2 [3]

6 Here is a Venn diagram.



30 students are asked if they have a dog or cat.

- 21 have a dog
- 16 have a cat
- 8 have a dog, but do not have a cat.

Complete the Venn diagram. [3]

Same as Q6 on draft spec

7 (a) Write numbers in the boxes below to make the statement true.

$15 \times 20 = 5 \times \square = 6 \times \square$

[2]

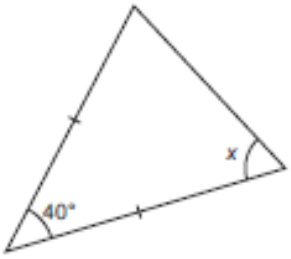
(b) I'm thinking of a number.
If I cube that number and then add 9, I get 17.

What number am I thinking of?

(b) ..... [2]

NEW

8 The diagram shows a triangle.



Not to scale

Find the value of x.
Give a reason for each step of your working.

Same as Q9 on draft spec

$x =$ ..... ° [3]

9 The pictogram shows how some passengers spent most of their time on a flight.

Reading	⊞ ⊞
Watching films	⊞ ⊞ □
Listening to music	
Playing games	⊞ ⊞ ▯
Other	⊞

Key: ⊞ represents 40 people

(a) How many passengers spent most of their time playing games?

(a) ..... [1]

(b) How many **more** passengers spent most of their time watching films than reading?

(b) ..... [1]

(c) There were 360 passengers on the plane altogether.

Work out how many spent most of their time listening to music and represent this number on the pictogram. [3]

Same as Q8 on draft spec

10 (a) Insert one of the symbols $<$, $>$ or $=$ to make each statement true.

(i) $^{-}5$ ..... $^{-}7$ [1]

(ii) 0.09 ..... 0.8 [1]

(iii) 6^2 ..... 12 [1]

(b) Work out the value of $5^{-2} \times 10^2$.

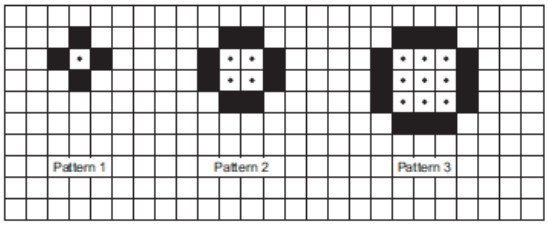
(b) ..... [2]

Same as Q10 on draft spec

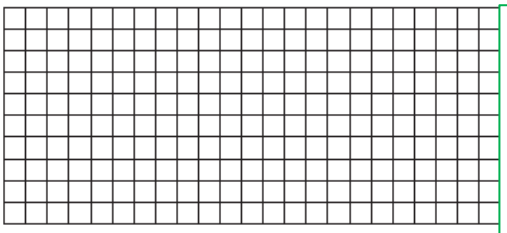
11 Show that $4(a+3)-3(a-2)=a+18$. **[2]**

NEW

12 Here are the first three patterns in a sequence.



(a) Draw Pattern 4 in this sequence on the grid below.



(b) Pattern 3 has 9 dotted squares and 12 black squares.

How many **dotted** squares will there be in Pattern 8?

(b) .....

(c) Write an expression for the number of **black** squares in the *n*th pattern.

(c) ..... **[2]**

(d) Sally looks at the patterns.
She says

If the pattern number is odd, the total number of squares will be odd.
If it is even, the total number of squares will be even.

Explain clearly why Sally is right for **all** patterns in the sequence.

.....

.....

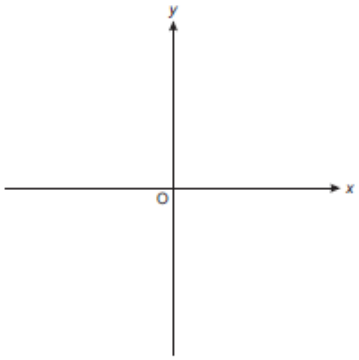
.....

.....

..... **[6]**

Same as Q12 on draft spec

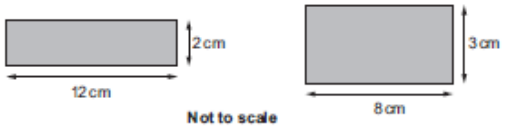
13 (a) (i) Sketch a graph on the axes below that shows that y is directly proportional to x.



[2]

(ii) Sketch a graph on the axes below that shows $y = x^3$.

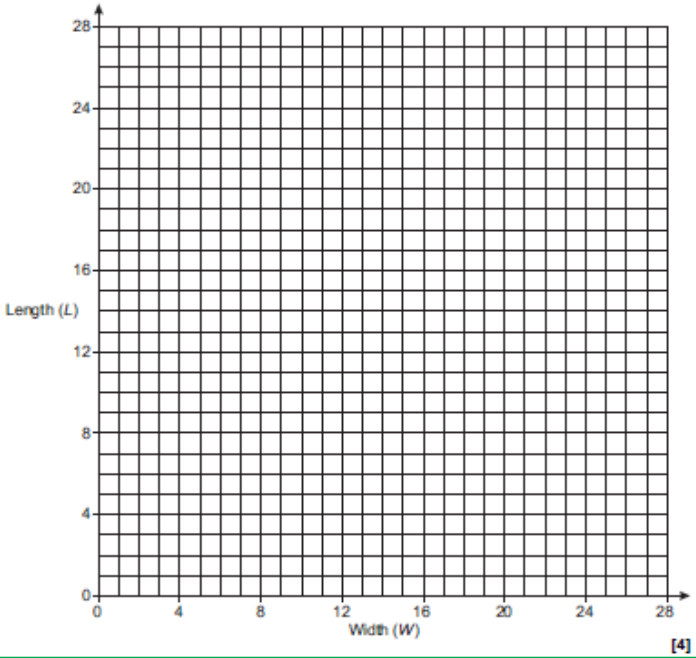
(b) It is possible to draw many rectangles which have area 24 cm^2.
Here are two of them.



Not to scale

For a rectangle of fixed area the length (L) is inversely proportional to the width (W).

Plot a graph to show this relationship for rectangles with area 24 cm^2.



[4]

Same as Q13 on draft spec

14 The value of a car £V is given by the equation

$$V = 20\,000 \times 0.9^t$$

where t is the age of the car in complete years.

(a) Write down the value of the car when new.

(a) £ ..... **[1]**

(b) What is the value of the car when it is 3 years old?

(b) £ ..... **[2]**

(c) After how many complete years will the car's value drop below £10 000?

(c) ..... **[2]**

Same as Q14 on draft spec

15 Kieran, Jermaine and Chris play football.
Kieran has scored 8 more goals than Chris.
Jermaine has scored 5 more goals than Kieran.
Altogether they have scored 72 goals.

How many goals did they each score?

Kieran .....

Jermaine .....

Chris .....

[5]

Same as Q15 on draft spec

16 Otis keeps bees in two beehives.
They are marked A and B in the scale drawing below.

Scale: 1 cm represents 50 metres

Based on Q16 on draft spec previous (a) was "what is the actual distance from beehive A to beehive B?"

(a) If Otis walks at about 2 m/s, estimate how long it takes him to walk from beehive A to beehive B.

(a) ..... [3]

(b) Bees do a 'waggle dance' to indicate to other bees where flowers are.

A bee indicates that there are flowers

- on a bearing of 055° from beehive A

and

- at a distance of 400 m from beehive A.

On the scale diagram, show the point where the flowers are.
Label the point **F**. [2]

(c) Otis decides to plant some fruit trees

- the same distance from beehive A and beehive B
- 200 m or less from each hive.

Indicate on the scale diagram where Otis could plant the trees.
You must show all your construction lines. [4]

17 Six equations are shown below, each labelled with a letter.

A	B	C
$y = -6x$	$x = \frac{1}{6}y$	$y = \frac{-3}{x}$

D	E	F
$x = \frac{6}{y}$	$y = 6x$	$y = \frac{2}{x} + 2$

Choose the correct letters to make each statement true.

(a) Equation ..... and equation ..... are equivalent. **[1]**

(b) Equation ..... and equation ..... show that x is inversely proportional to y. **[2]**

Same as Q17 on draft spec

18 Jo went for a bike ride one evening.
She travelled x kilometres in 5 hours.

Show that her average speed can be written as $\frac{x}{18}$ m/s. **[4]**

Same as Q18 on draft spec

19 Peter makes a large amount of pink paint by mixing red and white paint in the ratio 2 : 3.

Red paint costs £40 per 5 litres.
White paint costs £5 per 10 litres.

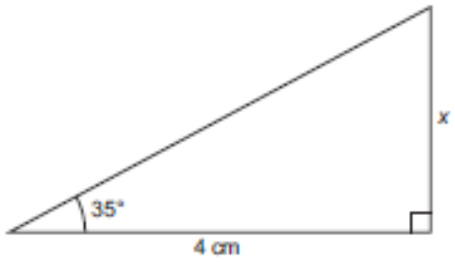
Peter sells his pink paint in 10-litre tins for £60 per tin.

Calculate how much profit he makes for each tin he sells.

NEW

£ ..... **[5]**

20 The diagram shows a right-angled triangle.



Not to scale

Calculate x.

Same as Q20 on draft spec

..... cm **[3]**

21 Louise travels to a meeting by train.
She catches a train in the morning to the meeting and then a train home in the evening.
The probability that the morning train is late is 0.7.
The probability that the evening train is late is 0.4.

What is the probability that **at least** one of the trains she catches is late?

..... **[4]**

Same as Q21 on draft spec

THE FOLLOWING HAVE BEEN REMOVED:

5 **(a)** Multiply out.

$3(2x + 5)$

(a) ..... **[1]**

(b) Factorise.

$3x + 9$

(b) ..... **[1]**

(c) Simplify.

$5c - 7d - 2c + 3d$

(c) ..... **[2]**

7 Work out.

(a) $2^4 + 3^2$

(a) ..... **[2]**

(b) $\frac{3}{8} + \frac{2}{5}$

(b) ..... **[2]**

11 **(a)** Calculate.

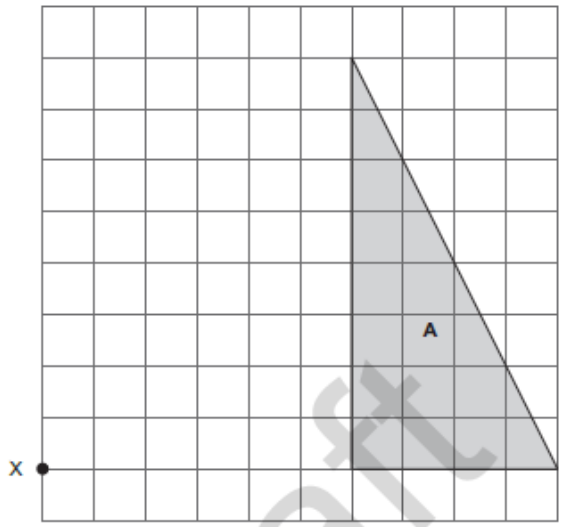
$$\sqrt{\frac{7.801}{0.732 + 1.277}}$$

Give your answer correct to 2 decimal places.

(a) ..... **[2]**

(b) Without using a calculator, use suitable approximations to check your answer to part **(a)**.
Show your working. **[2]**

19 Triangle **A** is shown on the grid.



Enlarge triangle **A** by scale factor $\frac{1}{2}$, centre X.
Label the image **B**. **[2]**