AQA – Ratio, proportion and rate of change – GCSE Mathematics Paper-3

1. May/2020/Paper_2F/No.11

    Here are two calculations.

A	B
$17^2 - 300$	$47 \times 21 - 10^3$

    Which calculation has the smaller answer?

    You **must** show the answer to each calculation.

    [2 marks]

    _____

    _____

    _____

    _____

    _____

    Answer _____

2. May/2020/Paper_2F/No.27

At a party there are 90 people.

48 are women and 42 are men.

Some women leave.

Some men arrive.

The ratio of women to men is now   10 : 11

Are there now more than 90 people at the party?

Tick **one** box.

☐ Yes   ☐ No   ☐ Cannot tell

Show working to support your answer.

[2 marks]

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3. May/2020/Paper_2F/No.29

A solid piece of silver has

mass 2.625 kilograms

volume 250 cm^3

Work out the density of the piece of silver.

Give your answer in grams per cubic centimetre.

[2 marks]

_____

_____

_____

Answer _____ g/cm^3

4. May/2020/Paper_2H/No.8

At a party there are 90 people.

48 are women and 42 are men.

Some women leave.

Some men arrive.

The ratio of women to men is now   10 : 11

Are there now more than 90 people at the party?

Tick **one** box.

☐ Yes   ☐ No   ☐ Cannot tell

Show working to support your answer.

[2 marks]

_____

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5. May/2020/Paper_2H/No.11

A solid piece of silver has

mass 2.625 kilograms

volume 250 cm^3

Work out the density of the piece of silver.

Give your answer in grams per cubic centimetre.

[2 marks]

Answer _____ g/cm^3

6. June/2019/Paper_2F/No.4

How many millimetres are equal to 3.27 metres?

Circle your answer.

[1 mark]

32.7   327   3270   32 700

7. June/2019/Paper_2F/No.5

Which is longer, $\frac{3}{4}$ of a day   or   1000 minutes?

You **must** show your working.

[3 marks]

Answer _____

8. June/2019/Paper_2F/No.12

A drawing has a scale of   1 : 40

On the drawing, a bedroom is a rectangle measuring 10 cm by 18 cm

A kitchen has an actual area of 300 000 cm^2

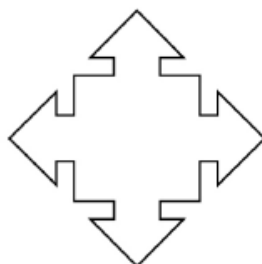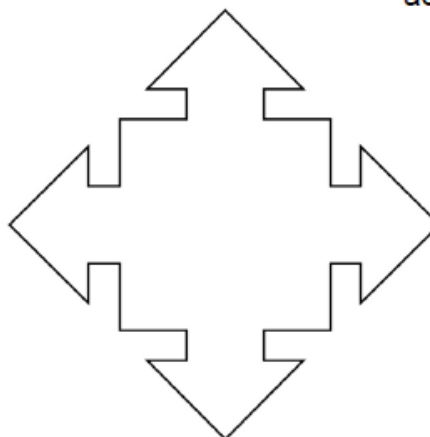Which has the bigger actual area, the kitchen or the bedroom?

You **must** show your working.

[4 marks]

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_____

_____

Answer _____

8. June/2019/Paper_2F/No.12

9.   June/2019/Paper_2F/No.13

Here are two similar shapes, A and B.

Not drawn
accurately

A   B

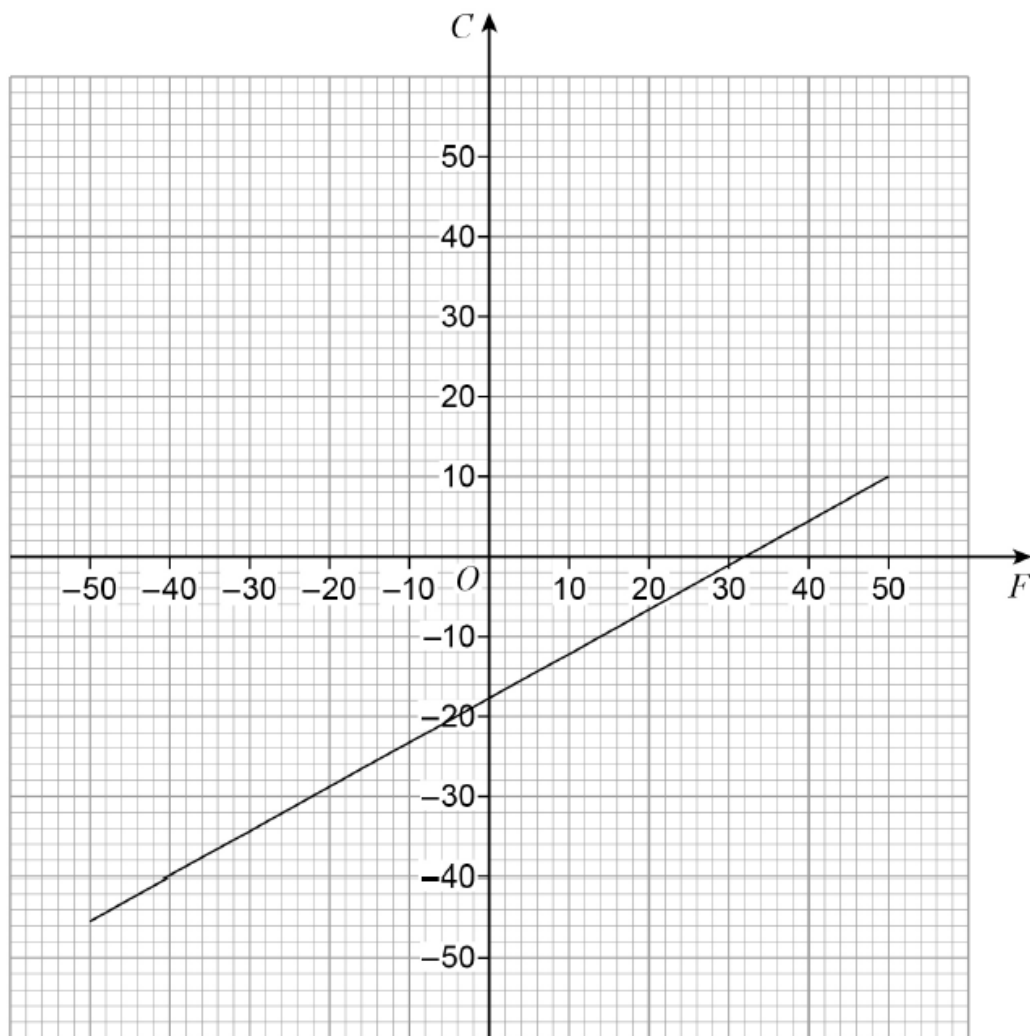length of edges in A : length of edges in B = 2 : 5

The perimeter of A is 210 mm

Work out the perimeter of B.

[2 marks]

_____

_____

_____

_____

Answer _____ mm

9.   June/2019/Paper_2F/No.13

10. June/2019/Paper_2F/No.16

The graph below is used to convert between

temperature in degrees Fahrenheit (F)

and

temperature in degrees Celsius (C).

(a) Use the graph to convert 40 degrees Fahrenheit into degrees Celsius.

[1 mark]

Answer _____ degrees Celsius

At one temperature, T,

the number of degrees Celsius is **double** the number of degrees Fahrenheit.

The graph of $C = 2F$ can be drawn to help find this temperature.

(b) On the grid opposite, draw the graph of $C = 2F$ for values of F from –25 to 25

You may use the table to help you.

[2 marks]

F	–25		
C	–50		

(c) Use your graph to estimate the value of T.
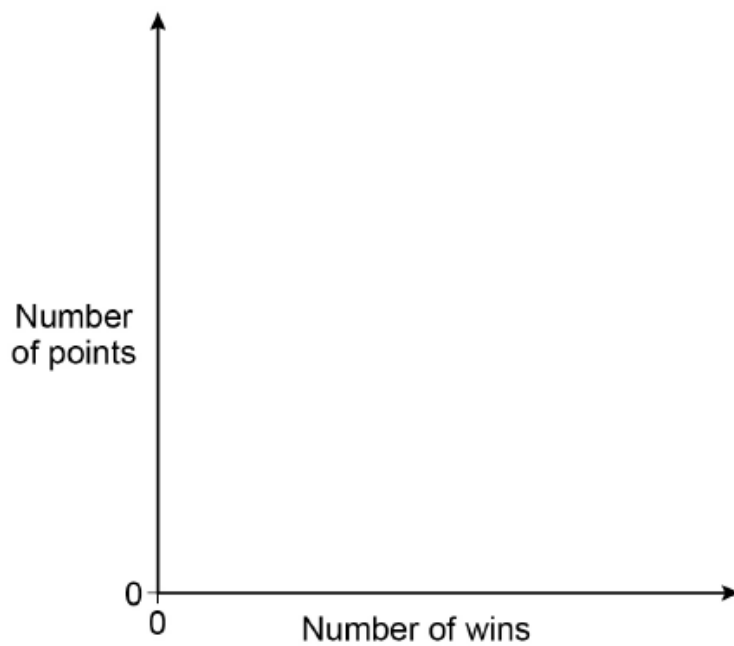Give your answer in degrees Celsius.

[2 marks]

Answer _____ degrees Celsius

11. June/2019/Paper_2F/No.19

In a sport, the number of points is directly proportional to the number of wins.

On the axes, sketch a graph to show this relationship.

[1 mark]

Number
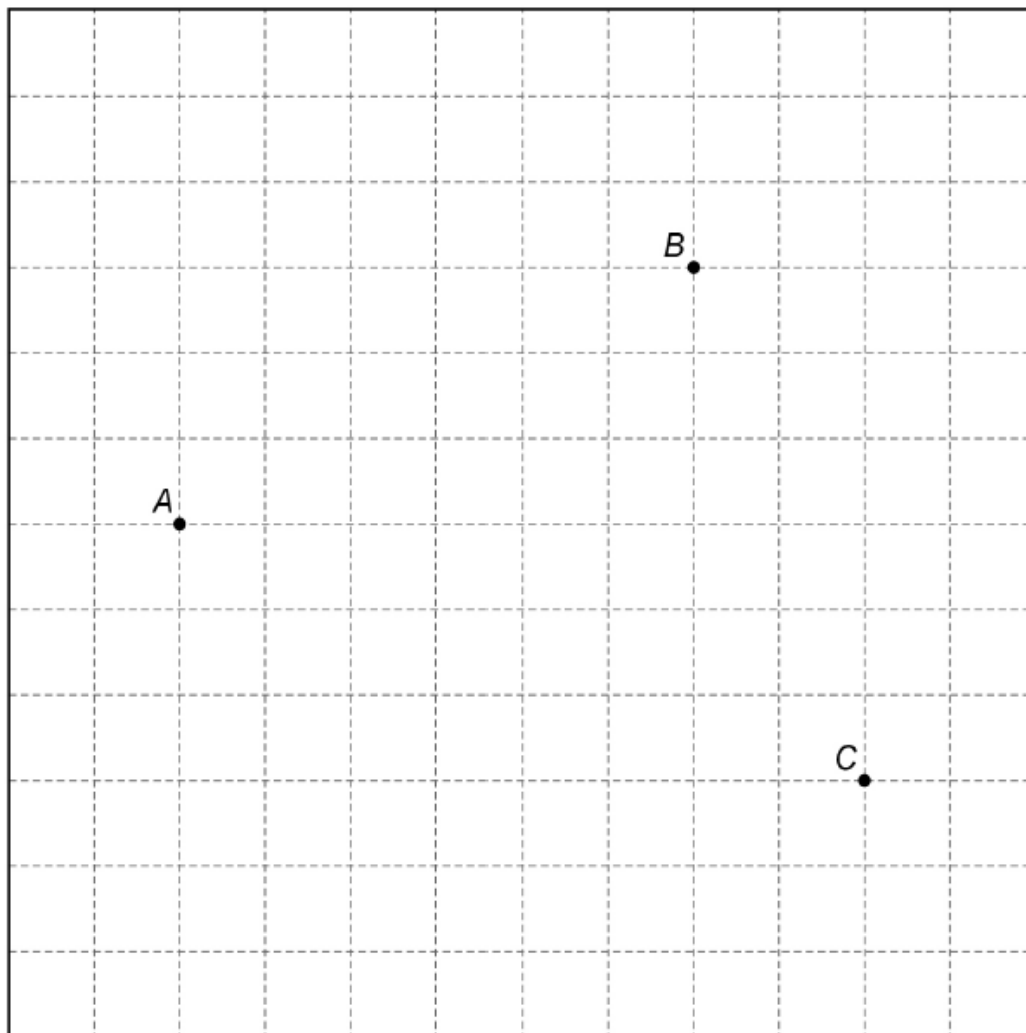of points

0

0   Number of wins

12. June/2019/Paper_2F/No.20

Using ruler and compasses, show the region inside the grid that is

less than 4 cm from A

and

nearer to B than to C.

Label the region R.

Show all your construction lines.

[3 marks]

13. June/2019/Paper_2F/No.21

Beth drives 200 miles in 4 hours.

She drives the first 18 miles at an average speed of 36 mph

Work out her average speed for the rest of the journey.

[3 marks]

Answer _____ mph

14. June/2019/Paper_2F/No.25

Joe and Kyle share an amount of money in the ratio $7 : n$

Joe gets 35% of the money.

Work out the value of n.

[2 marks]

_____

_____

_____

_____

_____

Answer _____

15. June/2019/Paper_2F/No.27

$x : y = 1 : 3$

Circle the correct equation.

[1 mark]

$y = 3x$ $\qquad\qquad$ $y = \dfrac{x}{3}$ $\qquad\qquad$ $y = x - 2$ $\qquad\qquad$ $y = x + 2$

16. June/2019/Paper_2H/No.3

Circle the point that lies on the curve $y = x^2 - 4x + 1$

[1 mark]

$(-1, 4)$ $(-1, -4)$ $(-1, -2)$ $(-1, 6)$

17. June/2019/Paper_2H/No.11

Joe and Kyle share an amount of money in the ratio $7 : n$

Joe gets 35% of the money.

Work out the value of n.

[2 marks]

_____

_____

_____

_____

_____

_____

Answer _____

18. June/2019/Paper_2H/No.18

In a bag there are blue discs, green discs and white discs.

There are four times as many blue discs as green discs.

number of blue discs : number of white discs = 3 : 5

One disc is selected at random.

Work out the probability that the disc is either blue or white.

[3 marks]

Answer _____

19. Nov/2019/Paper_2F/No.16

Three teams, A, B and C, play in a competition.

games won by A : games won by B = 2 : 1

games won by B : games won by C = 3 : 1

Team B has won 6 games.

In total, how many games have the three teams won?

[3 marks]

_____

_____

_____

_____

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_____

Answer _____

20. Nov/2019/Paper_2F/No.18

A drink is made by adding water to juice.

Instructions

Add an amount of water that is between 2 times and 3 times the amount of juice

---

Rana has 120 ml of juice.

She adds some water.

She has now made 450 ml of the drink.

Has Rana followed the instructions?

You **must** show your working.

[3 marks]

21. Nov/2019/Paper_2H/No.14 (b)

(b) Is the actual pressure greater than, equal to or less than your answer to part (a)?

Tick **one** box.

☐ greater than   ☐ equal to   ☐ less than

Give a reason for your answer.

[2 marks]

_____

_____

_____

_____

22. Nov/2019/Paper_2H/No.26

P, Q and R have positive values.

P is directly proportional to the square of Q.

When $P = 1.25$, $Q = 0.5$

Q is inversely proportional to R.

When $Q = 0.5$, $R = 6$

Work out the value of R when $P = 0.8$

[5 marks]

Answer _____