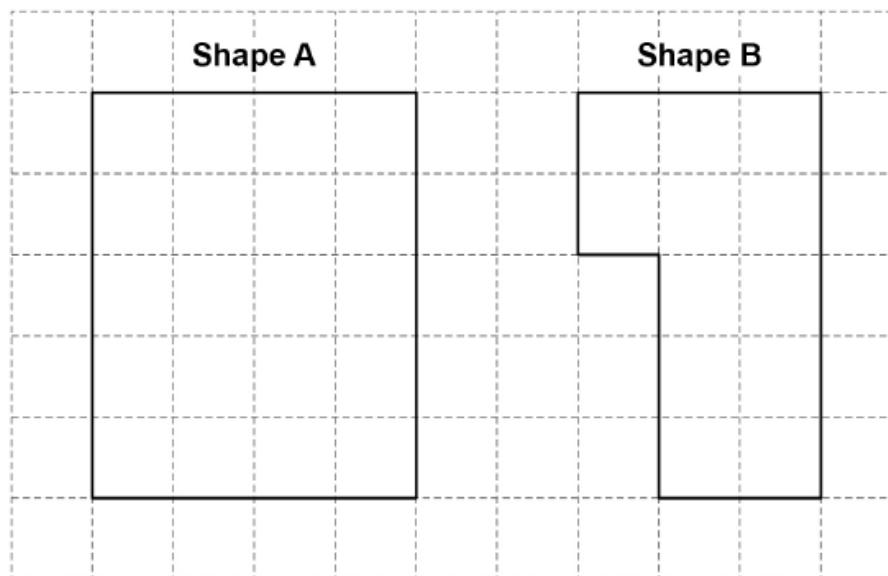**AQA – Ratio, proportion and rate of change – GCSE Mathematics Paper-1**

1.   May/2020/Paper_1F/No.5

Work out   area of Shape A : area of Shape B

Give your answer in its simplest form.

[2 marks]

_____

_____

_____

Answer _____ : _____

2. May/2020/Paper_1F/No.24

The cost of a holiday is £2400

Rana pays a deposit followed by monthly payments, in the ratio

deposit : total of the monthly payments = 3 : 5

She makes 6 equal monthly payments.

Work out her monthly payment.

[4 marks]

Answer £ _____

3.   May/2020/Paper_1F/No.26
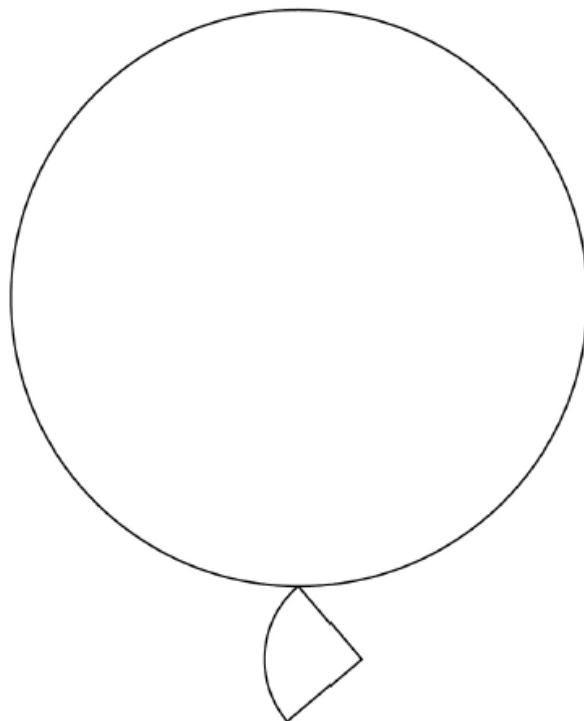
Two wire shapes make an earring.

The shapes are

a circle with radius 21 mm

and

a quarter circle.

Not drawn
accurately

radius of circle : radius of quarter circle = 7 : 2

(a)   Show that the radius of the quarter circle is 6 mm

[1 mark]

_____

_____

(b) Work out the **total** length of the wire in the earring.

Give your answer in the form $a\pi + b$ where a and b are integers.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

Answer _____ mm

4. May/2020/Paper_1H/No.10

The cost of a holiday is £2400

Rana pays a deposit followed by monthly payments, in the ratio

deposit : total of the monthly payments = 3 : 5

She makes 6 equal monthly payments.

Work out her monthly payment.

[4 marks]

Answer £ _____

5. May/2020/Paper_1H/No.15

(a) $c = 2^{10} \times 3 \times 5^6$

Work out $18c$.

Give your answer as a product of prime factors in index form.

[2 marks]

_____

_____

_____

_____

Answer _____

(b) Work out $\sqrt[3]{\dfrac{2^7 \times 11^3}{2}}$

Give your answer as an integer.

[2 marks]

_____

_____

_____

_____

Answer _____

6. May/2020/Paper_1H/No.22

(a) y is directly proportional to x^3

$y = 17$ when $x = 4$

Work out an equation connecting y and x.

[3 marks]

_____

_____

_____

_____

_____

_____

Answer _____

(b) m is inversely proportional to $\sqrt{r}$

The value of r is multiplied by 4

Circle what happens to the value of m.

[1 mark]

$\times\ 2$ $\times\ 16$ $\div\ 2$ $\div\ 16$

7

7.   May/2020/Paper_1H/No.27

A and B are similar solid cylinders.

| base area of A : base area of B = 9 : 25 |

Complete these ratios.

[2 marks]

curved surface area of A : curved surface area of B = _____ : _____

height of A : height of B = _____ : _____

8. June/2019/Paper_1F/No.17

(a) Simplify fully   56 : 24

[2 marks]

_____

_____

_____

Answer _____ : _____

(b) Write the ratio   5 : 4   in the form n : 1

[1 mark]

_____

_____

_____

Answer _____ : _____

(c) Share £180 in the ratio   1 : 9

[2 marks]

_____

_____

_____

_____

_____

Answer £_____ and £_____

9

9. June/2019/Paper_1F/No.22

Three friends arrive at a party.

Their arrival increases the number of people at the party by 20%

In total, how many people are now at the party?

[2 marks]

Answer _____
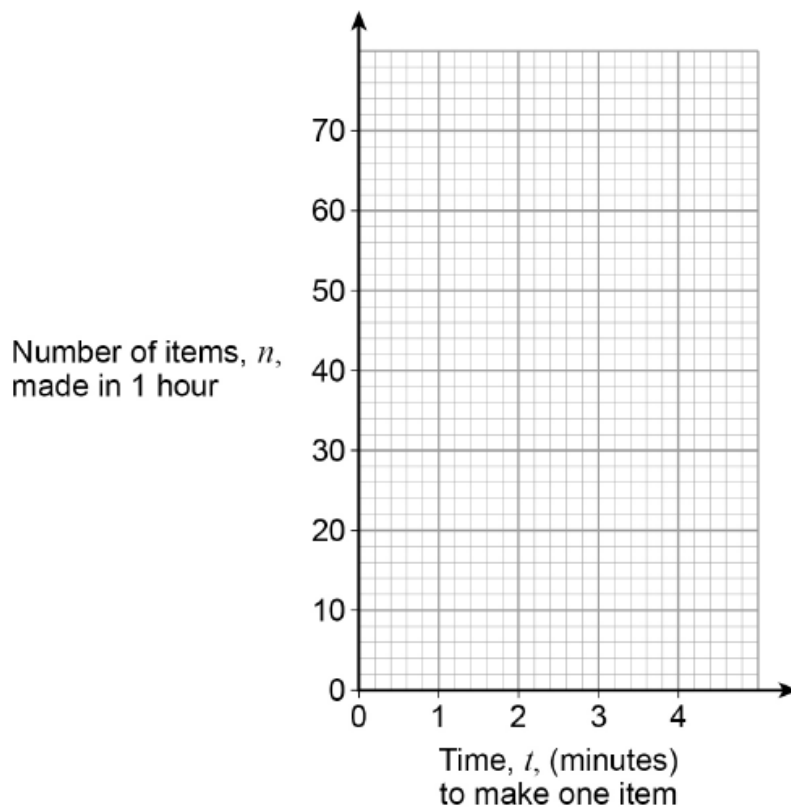
10. June/2019/Paper_1F/No.26

The number of items, n, made in 1 hour by a machine is given by $n = \dfrac{60}{t}$

t is the time in minutes the machine takes to make one item.

The value of t changes for different types of item.

(a) On the grid below, draw the graph of $n = \dfrac{60}{t}$ for values of t from 1 to 4

[2 marks]

Number of items, n, made in 1 hour

Time, t, (minutes) to make one item

(b) The machine takes 3 minutes 30 seconds to make one item.

Use your graph to estimate the value of n.

[2 marks]

Answer _____
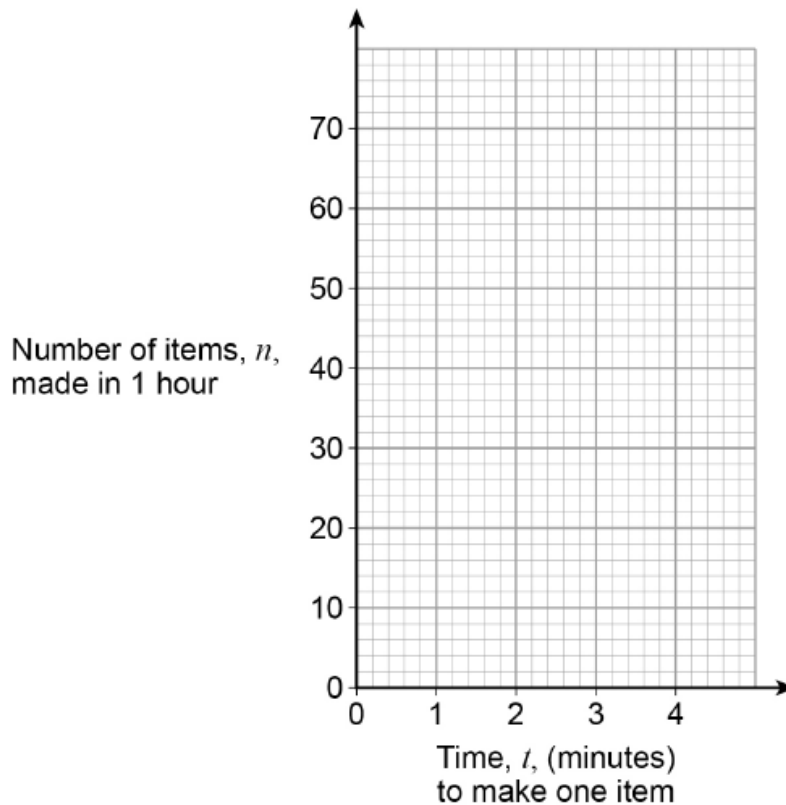
11

11. June/2019/Paper_1H/No.10

The number of items, n, made in 1 hour by a machine is given by $n = \dfrac{60}{t}$

t is the time in minutes the machine takes to make one item.

The value of t changes for different types of item.

(a) On the grid below, draw the graph of $n = \dfrac{60}{t}$ for values of t from 1 to 4
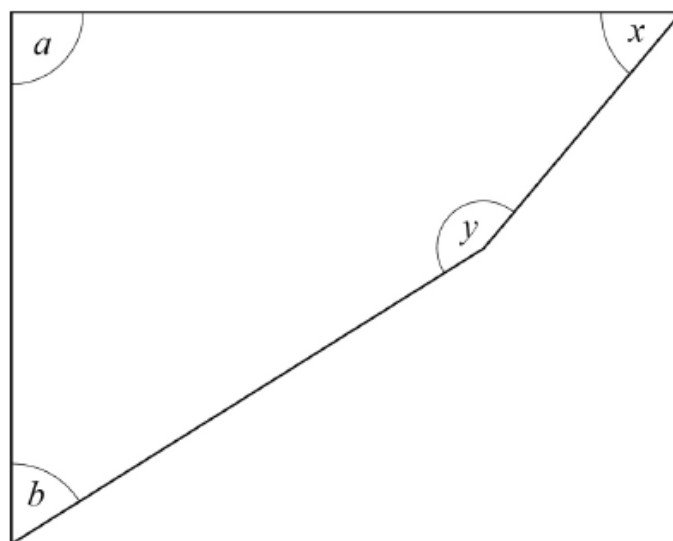
[2 marks]

Number of items, n, made in 1 hour

Time, t, (minutes) to make one item

(b) The machine takes 3 minutes 30 seconds to make one item.

Use your graph to estimate the value of n.

[2 marks]

Answer _____

12. June/2019/Paper_1H/No.14

Here is a quadrilateral.

Not drawn accurately

$a = 90°$ and $a : b = 5 : 3$

$x : y = 1 : 3$

Show that $b = x$

[3 marks]

_____

_____

_____

_____

_____

_____

_____

_____

_____

13. June/2019/Paper_1H/No.16

Simplify fully $\dfrac{4x - 8x^2}{12x - 6}$

[3 marks]

_____

_____

_____

_____

_____

_____

Answer _____

14. Nov/2019/Paper_1F/No.12

A college has

a total of 105 teachers

19 more female teachers than male teachers.

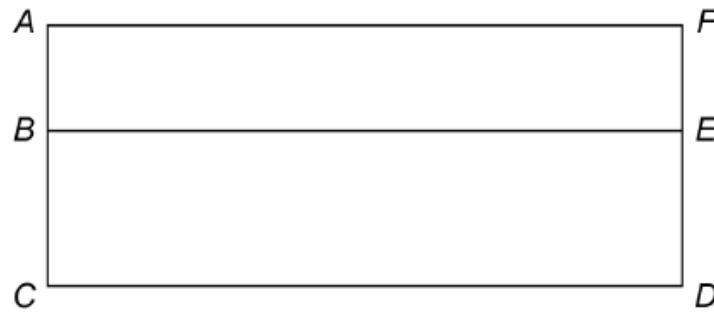What proportion of the teachers are female?

[3 marks]

_____

_____

_____

_____

_____

Answer _____

15. Nov/2019/Paper_1F/No.14

ABEF and *ACDF* are rectangles.

$AF = 10$ cm $AB = 2$ cm $BC = 4$ cm

Not drawn accurately

Work out

perimeter *ABEF* : perimeter *ACDF*

Give your answer in its simplest form.

[3 marks]

Answer _____ : _____

16

16. Nov/2019/Paper_1F/No.19

(a)   In a field

number of sheep : number of cows = 10 : 3

Zak says,

"There are 10 sheep in the field."

Give a reason why Zak **could** be wrong.

[1 mark]

_____

_____

(b)   In a different field

number of goats : number of pigs = 13 : 4

Priya says,

"There are more than three times as many goats as pigs."

Is she correct?

Tick **one** box.

☐ Yes   ☐ No   ☐ Cannot tell

Show working to support your answer.

[1 mark]

_____

_____

17. Nov/2019/Paper_1F/No.22

In a **right-angled** triangle

smallest angle : largest angle = 2 : 5

Work out the three angles of the triangle.

[4 marks]

_____ degrees

_____ degrees

_____ degrees

18.

Saj makes Rose Pink paint and Cherry Pink paint.

He mixes red paint with white paint as shown.

Rose Pink
red : white = 1 : 2

Cherry Pink
red : white = 4 : 3

He makes 60 litres of Rose Pink paint.

To this Rose Pink paint he adds

     80 litres of red paint and 28 litres of white paint.

Has he now made Cherry Pink paint?

You **must** show your working.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

19. Nov/2019/Paper_1F/No.30

(a) Work out $\dfrac{2 \times 10^{14}}{8 \times 10^9}$

Give your answer in standard form.

[2 marks]

_____

_____

_____

_____

Answer _____

(b) $6200.07 = 6.2 \times 10^c + 7 \times 10^d$

Work out the values of c and d.

[2 marks]

_____

_____

$c =$ _____ $d =$ _____

20. Nov/2019/Paper_1H/No.10

Saj makes Rose Pink paint and Cherry Pink paint.

He mixes red paint with white paint as shown.

Rose Pink	Cherry Pink
red : white = 1 : 2	red : white = 4 : 3

He makes 60 litres of Rose Pink paint.

To this Rose Pink paint he adds

      80 litres of red paint and 28 litres of white paint.

Has he now made Cherry Pink paint?

You **must** show your working.

[4 marks]

21. Nov/2019/Paper_1H/No.12

$$V = \frac{k}{H}$$ where k is a constant.

Which **two** statements are correct?

Tick **two** boxes.

[1 mark]

☐ V is directly proportional to H

☐ V is inversely proportional to H

☐ V is directly proportional to $\dfrac{1}{H}$

☐ V is inversely proportional to $\dfrac{1}{H}$

22. Nov/2019/Paper_1H/No.16

In a box there are some buttons.

45 are large and the rest are small.

Some are yellow and the rest are green.

The number of small is $\dfrac{5}{3}$ of the number of large.

The number of green is 300% of the number of yellow.

There are 12 small yellow buttons.

How many large green buttons are there?

You may use the two-way table to help you.

[4 marks]

	Large	Small	
Yellow		12	
Green			
	45		

_____

_____

_____

_____

_____

_____

Answer _____