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CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/33

Paper 3 (Core)

May/June 2023

1 hour 45 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π , use your calculator value.

INFORMATION

- The total mark for this paper is 96.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages. Any blank pages are indicated.

Formula List

Area, A , of triangle, base b , height h . $A = \frac{1}{2}bh$

Area, A , of circle, radius r . $A = \pi r^2$

Circumference, C , of circle, radius r . $C = 2\pi r$

Curved surface area, A , of cylinder of radius r , height h . $A = 2\pi rh$

Curved surface area, A , of cone of radius r , sloping edge l . $A = \pi rl$

Curved surface area, A , of sphere of radius r . $A = 4\pi r^2$

Volume, V , of prism, cross-sectional area A , length l . $V = Al$

Volume, V , of pyramid, base area A , height h . $V = \frac{1}{3}Ah$

Volume, V , of cylinder of radius r , height h . $V = \pi r^2 h$

Volume, V , of cone of radius r , height h . $V = \frac{1}{3}\pi r^2 h$

Volume, V , of sphere of radius r . $V = \frac{4}{3}\pi r^3$

Answer **all** the questions.

1 (a) Work out.

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

..... [1]

(ii) $5^3 - 2^4$

..... [2]

(b) Write 80 as a product of its prime factors.

..... [2]

(c) Work out $450000000 - 5.8 \times 10^7$.
Give your answer in standard form.

..... [2]

(d) Write 3.9×10^{-4} as an ordinary number.

..... [1]

2 (a) These are the highest temperatures, in °C, each day during one month.

5 4 3 1 2 4 6 6 7 7
 5 8 9 8 10 9 10 10 9 10
 9 8 8 9 8 7 7 9 10 9

(i) Complete the frequency table.

Temperature (°C)	1	2	3	4	5	6	7	8	9	10
Frequency	1	1	1							5

[2]

(ii) Find how many days there are in this month.

..... [1]

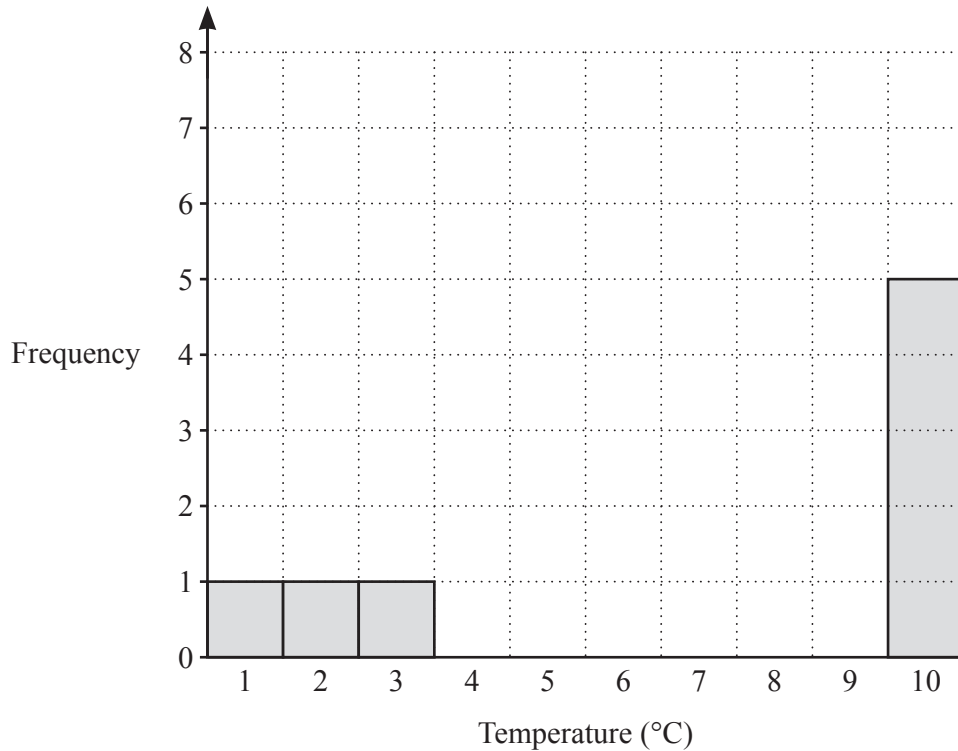
(iii) What is the most common highest temperature this month?

..... °C [1]

(iv) Find how many **more** days have a highest temperature of 9°C than have a highest temperature of 6°C.

..... [1]

(v) Complete the bar chart to show the information in the table.



[2]

(b) These are the amounts of rainfall, in mm, measured during one week.

13 6 7 11 4 6 9

(i) Work out the range.

..... mm [1]

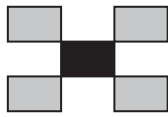
(ii) Work out the mean.

..... mm [1]

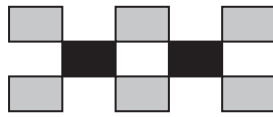
(iii) Work out the median.

..... mm [2]

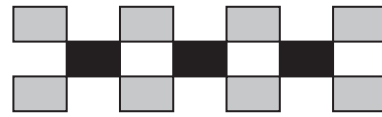
3 (a) These are the first three patterns in a sequence of grey tiles and black tiles.



Pattern 1

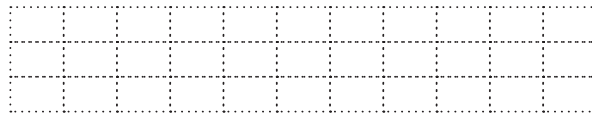


Pattern 2



Pattern 3

(i) On the grid below, draw Pattern 4 in the sequence of grey and black tiles.



[1]

(ii) Complete the table.

Pattern number	1	2	3	4	5
Number of black tiles	1	2	3	4	5
Number of grey tiles	4				

[2]

(iii) One of the patterns in this sequence has 16 grey tiles.

Work out how many black tiles there are in this pattern.

..... [1]

(iv) One of the patterns in this sequence has 10 black tiles.

Work out how many grey tiles there are in this pattern.

..... [1]

(b) (i) Find the first term and the sixth term of this sequence of numbers.

..... 3 9 15 21

[2]

(ii) Write down the rule for continuing this sequence.

..... [1]

(iii) Find the n th term of this sequence.

..... [2]

4 (a) (i) Find the value of $5y^2 - 10y$ when $y = 3$.

..... [2]

(ii) Factorise completely.

$$5y^2 - 10y$$

..... [2]

(b) Solve.

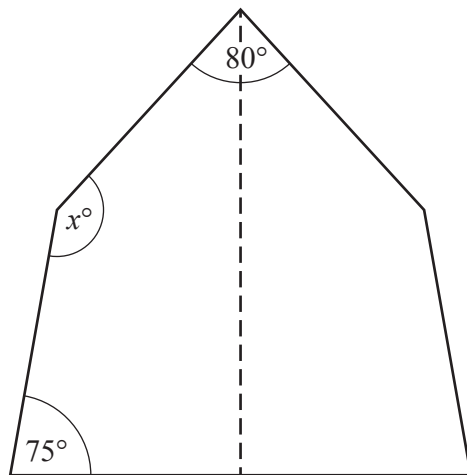
(i) $x - 4 = 9$

$x =$ [1]

(ii) $3x - 5 = 7$

$x =$ [2]

- 5 (a) This pentagon has one line of symmetry, shown dashed in the diagram.

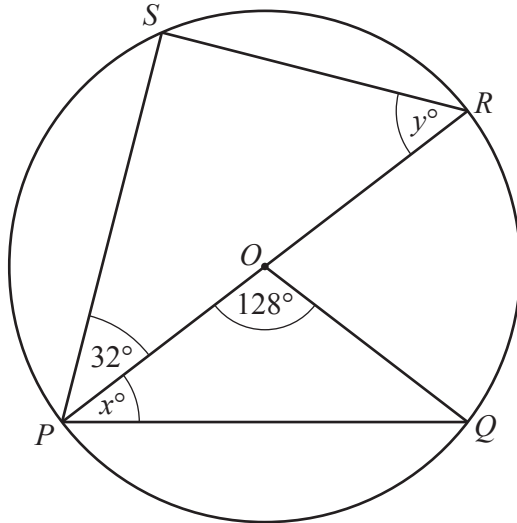


NOT TO
SCALE

Work out the value of x .

$x = \dots\dots\dots$ [4]

(b)



NOT TO SCALE

P , Q , R and S are points on the circle, centre O .
 POR is a straight line.

(i) Give a reason why triangle OPQ is isosceles.

.....
 [1]

(ii) Work out the value of x .

$x =$ [2]

(iii) Work out the value of y .

$y =$ [2]

6 (a) At a fast food restaurant, a burger costs \$6.40 and a milkshake costs \$2.50 .

(i) Work out the total cost of 4 burgers and 3 milkshakes.

\$ [2]

(ii) Toby buys one burger and one milkshake.

Work out how much change he gets from \$10.

\$ [2]

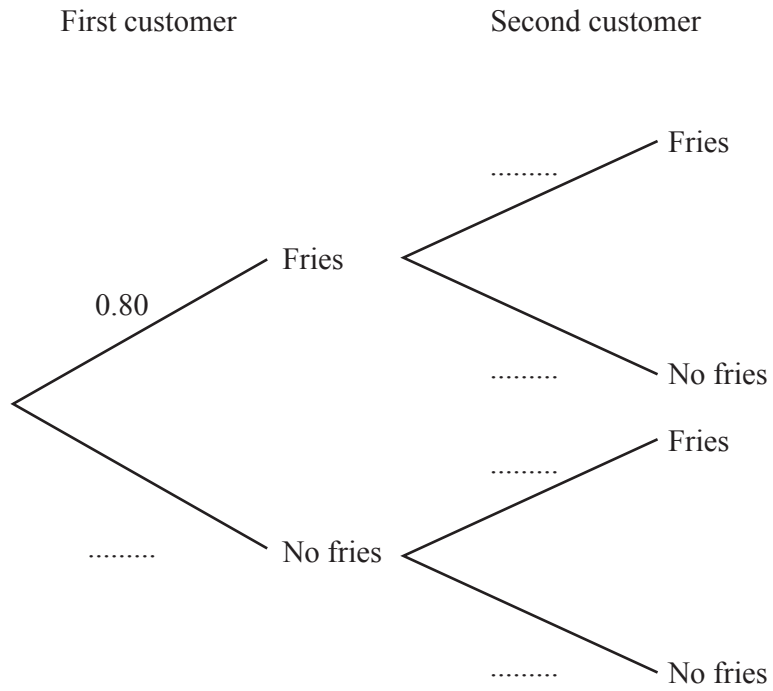
(iii) Some friends buy 2 burgers and a number of milkshakes.
They pay a total of \$30.30 .

Work out how many milkshakes they buy.

..... [3]

(b) Toby notices that 80% of all customers in this fast food restaurant order fries.

(i) Complete this tree diagram for the next two customers at the restaurant.

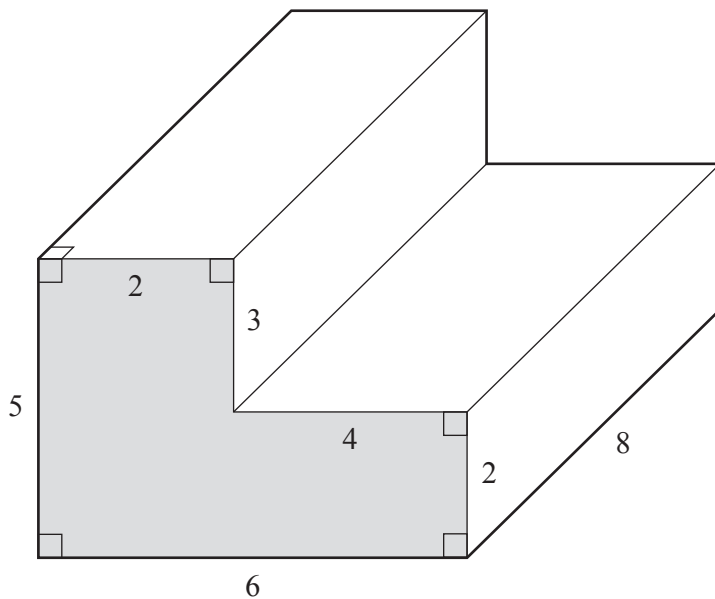


[2]

(ii) Find the probability that both customers **do not** order fries.

..... [2]

- 7 (a) The diagram shows a prism.
All measurements are in centimetres.



NOT TO SCALE

- (i) Find the total number of faces of this prism.

..... [1]

- (ii) Work out the perimeter and area of the shaded face.
Give the units of each answer.

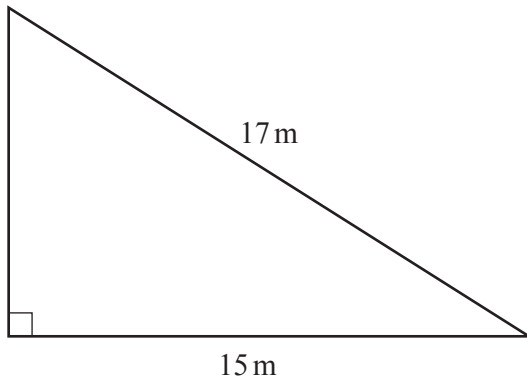
Perimeter =

Area = [4]

- (iii) Work out the volume of the prism.

..... cm³ [1]

(b)

NOT TO
SCALE

Work out the area of this triangle.

..... m² [5]

- 8 (a) Atif and Faiza share \$5000 in this ratio.

$$\text{Atif : Faiza} = 3 : 7$$

Work out how much they each receive.

Atif \$

Faiza \$ [2]

- (b) Atif earns \$2200 each month.

Each month he gives $\frac{1}{8}$ of his earnings to charity.

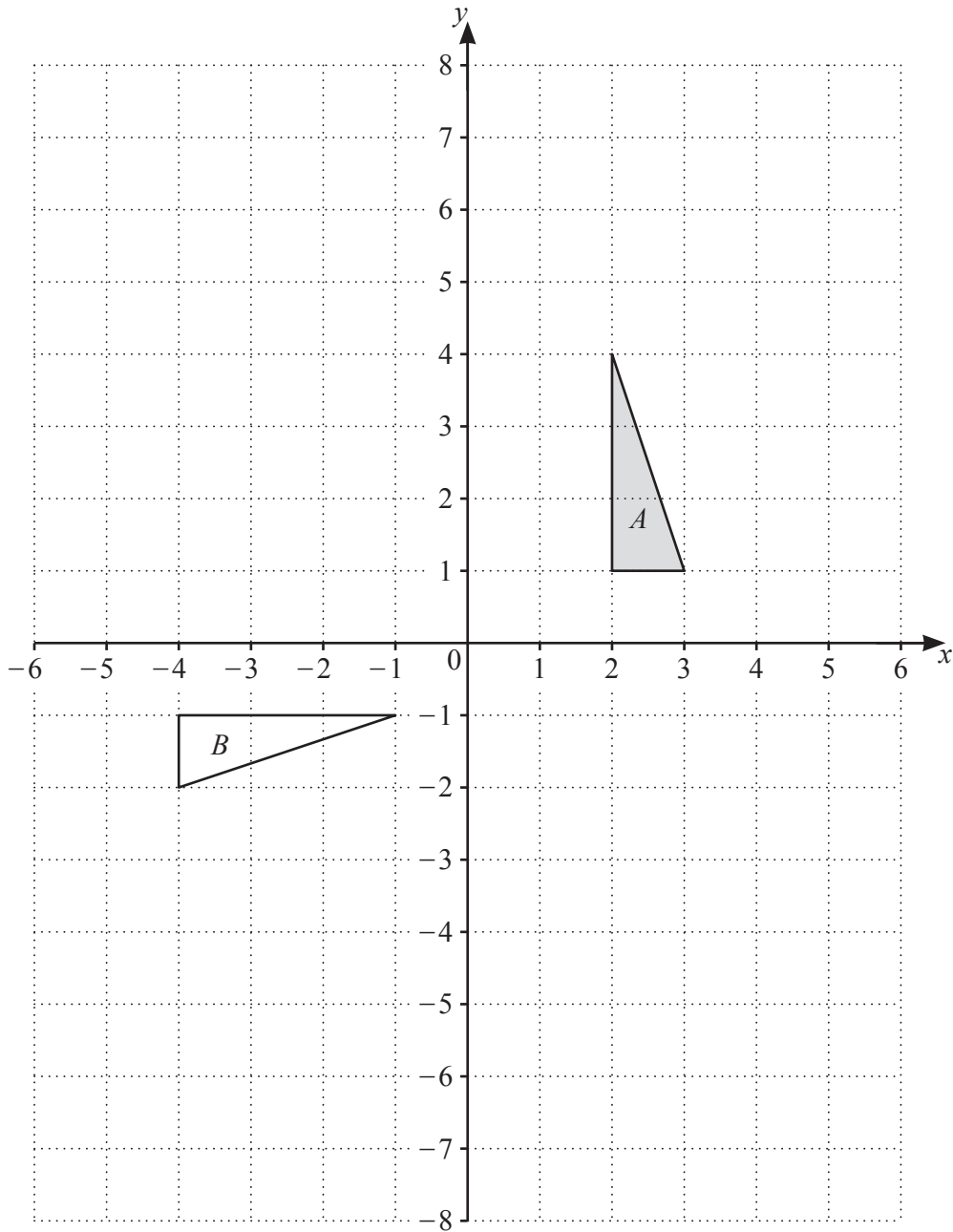
Work out how much Atif has left each month after giving to charity.

\$ [2]

- (c) Faiza gives \$40 to charity each month.
She increases this amount by 14%.

Work out how much Faiza now gives to charity each month.

\$ [2]



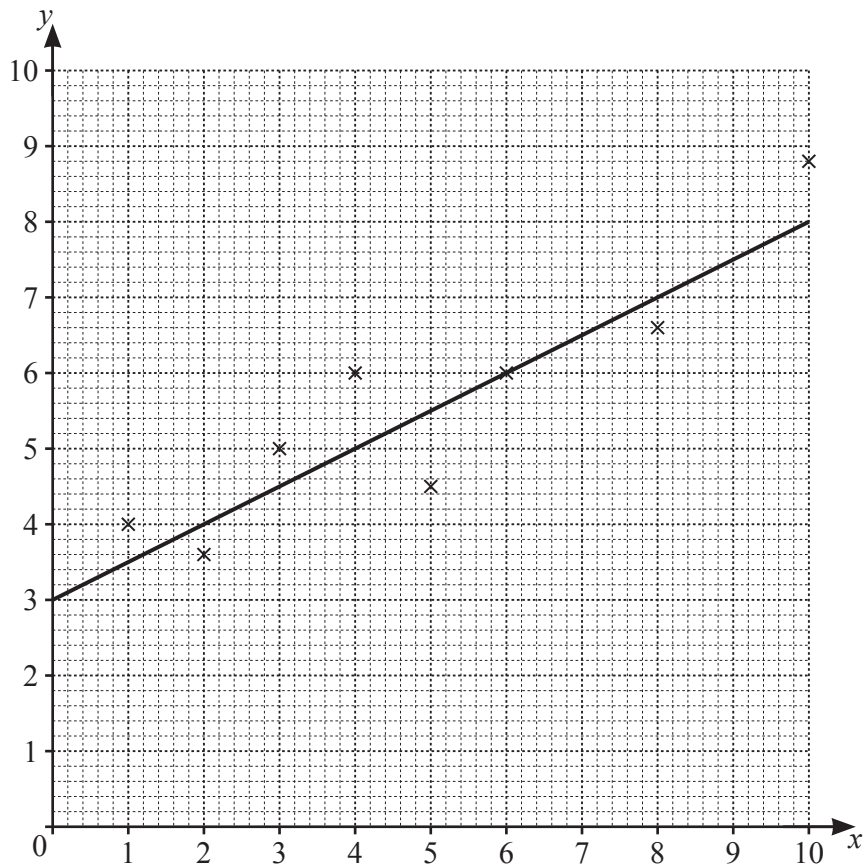
- (a) Reflect triangle *A* in the *y*-axis.
Label the image *X*. [1]

- (b) Rotate triangle *A* by 90° clockwise about $(0, 0)$.
Label the image *Y*. [2]

- (c) Describe fully the **single** transformation which maps triangle *Y* onto triangle *B*.
.....
..... [2]

- (d) Enlarge triangle *A* by scale factor 2 from centre $(1, 1)$.
Label the image *Z*. [2]

10 Jonah draws a line of best fit on a scatter diagram.



(a) What type of correlation is shown in the diagram?

..... [1]

(b) Use the line of best fit to find y when $x = 5.6$.

$y =$ [1]

(c) Find the equation of the line of best fit.
Give your answer in the form $y = mx + c$.

$y =$ [3]

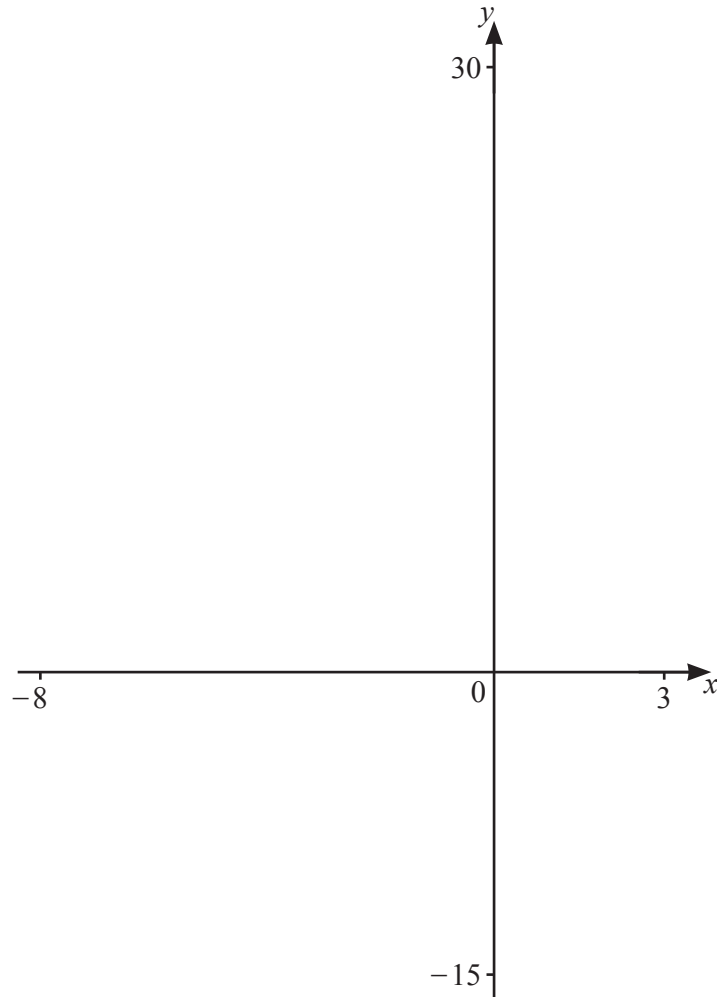
(d) Jonah finds information for two more points for his scatter diagram.

x	6.8	9
y	8	9.4

(i) Plot these points on the scatter diagram. [1]

(ii) How should Jonah now alter his line of best fit?

..... [1]



(a) (i) On the diagram, sketch the graph of $y = x^2 + 7x$ for $-8 \leq x \leq 3$. [2]

(ii) Find the coordinates of the local minimum.

(.....,) [2]

(b) On the diagram, sketch the graph of $y = \frac{36}{x}$ for values of x between -8 and 3 . [2]

(c) Find the x -coordinate of each point of intersection of $y = x^2 + 7x$ and $y = \frac{36}{x}$.

$x =$ and $x =$ and $x =$ [3]

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