

List of formulas

Area, A , of triangle, base b , height h .

$$A = \frac{1}{2}bh$$

Area, A , of circle of radius r .

$$A = \pi r^2$$

Circumference, C , of circle of 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 .

$$A = \pi rl$$

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 .

$$V = \frac{4}{3}\pi r^3$$

Calculators must **not** be used in this paper.

- 1 (a) Work out $\frac{5}{6}$ of 42.

..... [1]

- (b) Write 0.15 as a percentage.

..... % [1]

- (c) Complete the statement.

$$40\% = \frac{\boxed{}}{20}$$

[2]

- 2 Write down all the factors of 21.

..... [2]

- 3 Robin spends 1 hour answering questions in his homework.
Robin spends 5 minutes answering each question.

Work out the number of questions Robin answers.

..... [2]

4 (a) Work out.

$$4\frac{1}{5} \div 5$$

Give your answer as a fraction.

..... [2]

(b) Work out $13 - 1 \times -7$.

..... [1]

5 This is a list of numbers.

-7 1 49 10 3 45 33

From the list, write down

(a) the cube number

..... [1]

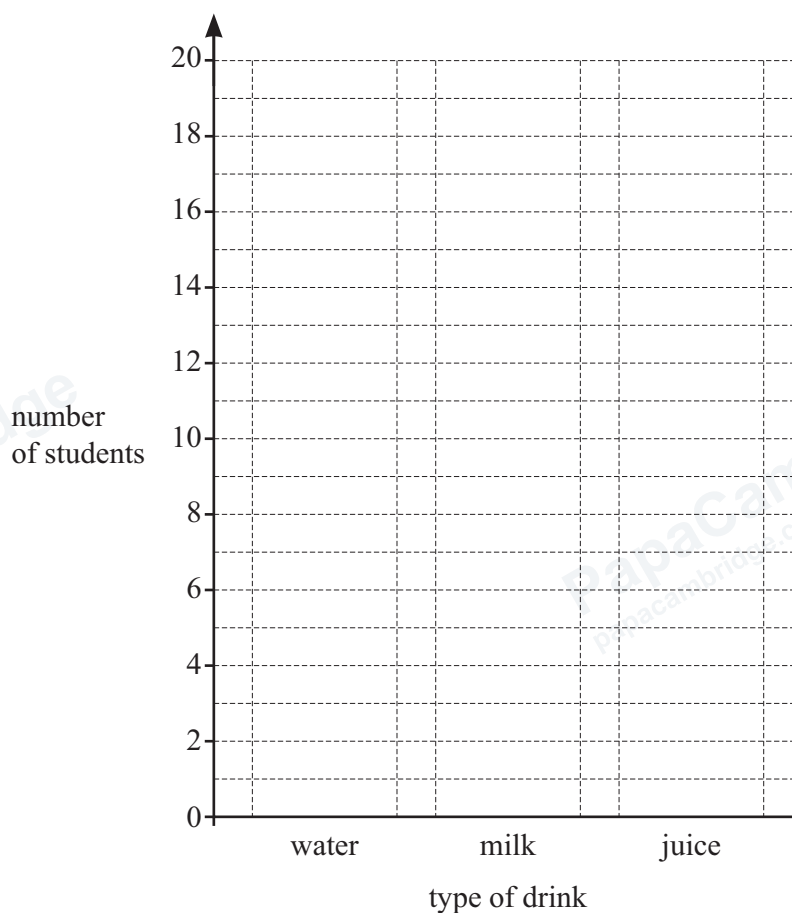
(b) the number that is a common multiple of 3 and 5.

..... [1]

- 6 The table shows the choice of drink for some students in a school.

type of drink	number of students
water	20
milk	8
juice	12

- (a) On the grid, draw a bar chart to show this information.



[2]

- (b) One of these students is chosen at random.

Write down the probability that this student chooses water.
Give your answer as a fraction in its simplest form.

[2]



7 Line L has equation $y = 2x - 5$.

(a) Line L crosses the y -axis at point A .

Write down the coordinates of A .

$A = (\dots\dots\dots , \dots\dots\dots)$ [1]

(b) Write down the gradient of line L .

$\dots\dots\dots$ [1]

(c) Point B has coordinates $(4, 3)$.

Show that line L passes through B .

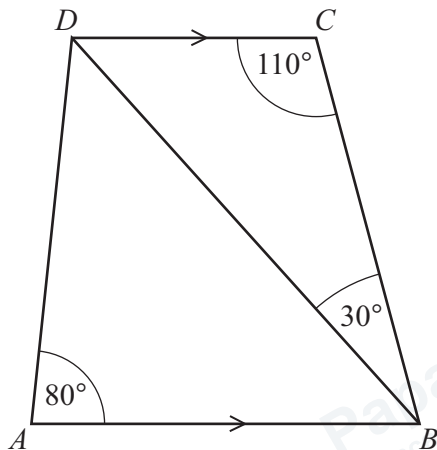
[1]

(d) Find the coordinates of the midpoint of AB .

$(\dots\dots\dots , \dots\dots\dots)$ [2]



8 The diagram shows a quadrilateral $ABCD$.



NOT TO SCALE

AB is parallel to DC .

(a) Write down the mathematical name of this quadrilateral.

..... [1]

(b) Find the size of the following angles.
Give a geometric reason for each answer.

(i) Angle CDB = ... because
..... [2]

(ii) Angle DBA = ... because
..... [2]

(c) Complete each statement with a mathematical name.

(i) Triangle BCD is a triangle. [1]

(ii) Angle DCB is an angle. [1]

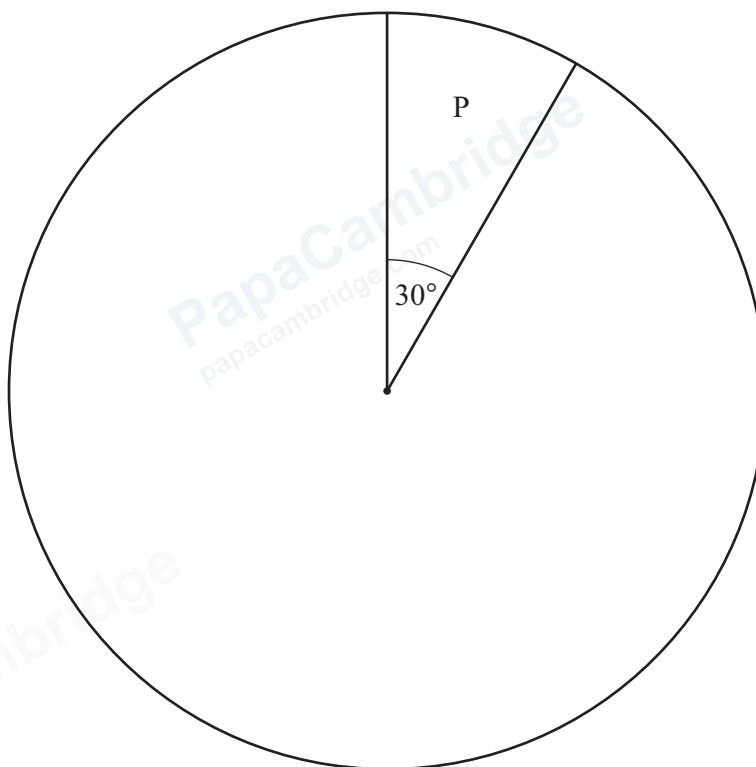
- 9 Hanan is drawing a pie chart to show the number of each type of email she receives one day.

type of email	frequency	pie chart angle
promotions (P)	5	30°
main (M)	15	
work (W)	30	
social (S)	10	

- (a) Complete the table.

[2]

- (b) Complete the pie chart to show this information.



[2]





- 10 x and y are integers between 26 and 65.
 x is a square number,
 y is a cube number,
 $(x - y)$ is a prime number.

Find the value of x and the value of y .

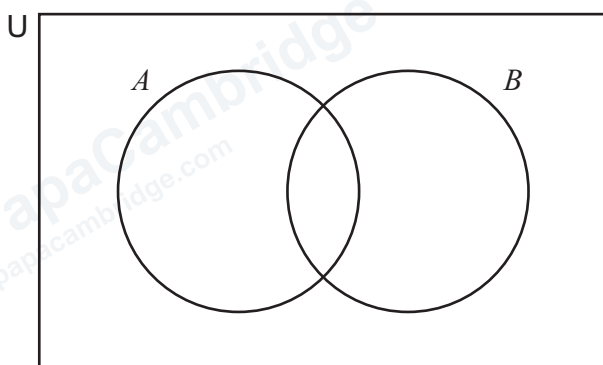
$x =$

$y =$

[3]

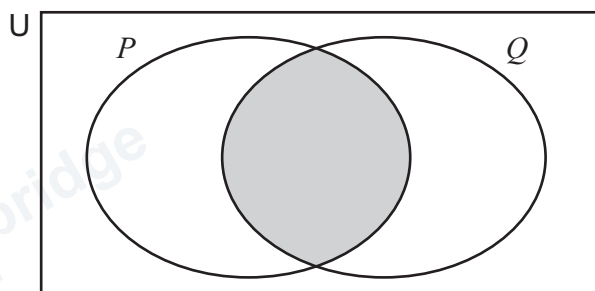
- 11 (a) $U = \{\text{integers from 1 to 12}\}$
 $A = \{2, 5, 9, 11, 12\}$
 $B = \{3, 5, 7, 9, 12\}$

Complete the Venn diagram.



[2]

- (b) Use set notation to describe the shaded region.



..... [1]



- 12 A bag contains red counters and green counters.
The ratio red counters : green counters = 2 : 3.

- (a) Sammy takes a counter at random from the bag and replaces it.
Sammy repeats this 200 times.

Work out the expected number of times Sammy takes a green counter.

..... [2]

- (b) Maddy says that the total number of counters in the bag is 88.

Explain why Maddy must be wrong.

..... [1]

- 13 (a) Factorise $12b^4 - 3b$.

..... [2]

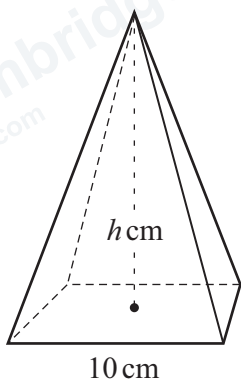
- (b) Expand and simplify.

$$2(3x - 1) + 5(2x + 5)$$

..... [2]



14



NOT TO SCALE

The diagram shows a pyramid with height h cm.
The base of the pyramid is a square with side 10 cm.
The volume of the pyramid is 900 cm^3 .

Work out the value of h .

$h = \dots\dots\dots$ [3]

15 Solve the simultaneous equations.

$$6x + 7y = 32$$

$$4x - 3y = 6$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

[4]

Questions 16 and 17 are on the back page.

- 16 The circumference of a circle is 12π metres.

Work out the area of the circle.
Give your answer in terms of π .

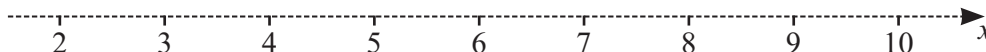
..... m^2 [3]

- 17 (a) Write down all the integer values of n that satisfy this inequality.

$$2 < n \leq 6$$

..... [2]

- (b) Show the inequality $4 \leq x < 8$ on the number line.



[2]

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