PapaCambridge

Topical Worksheets for Cambridge IGCSE™

Mathematics (0580)

Numbers, Algebra and Graphs

1st edition, for examination until 2025

1 $P = 2(w + h)$

$w = 12$ correct to the nearest whole number.
$h = 4$ correct to the nearest whole number.

Work out the upper bound for the value of P.

..... [2]

[Total: 2]

2 Arjun earned \$36 515 in 2019.
This was an increase of 9% on his earnings in 2018.

Work out his earnings in 2018.

\$ ..... [2]

[Total: 2]

3 $234 = 2 \times 3^2 \times 13$ $1872 = 2^4 \times 3^2 \times 13$ $234 \times 1872 = 438\,048$

Use this information to write 438 048 as a product of its prime factors.

..... [1]

[Total: 1]

4 Find the lowest common multiple (LCM) of 8 and 14.

..... [2]

[Total: 2]

5 x is an integer.

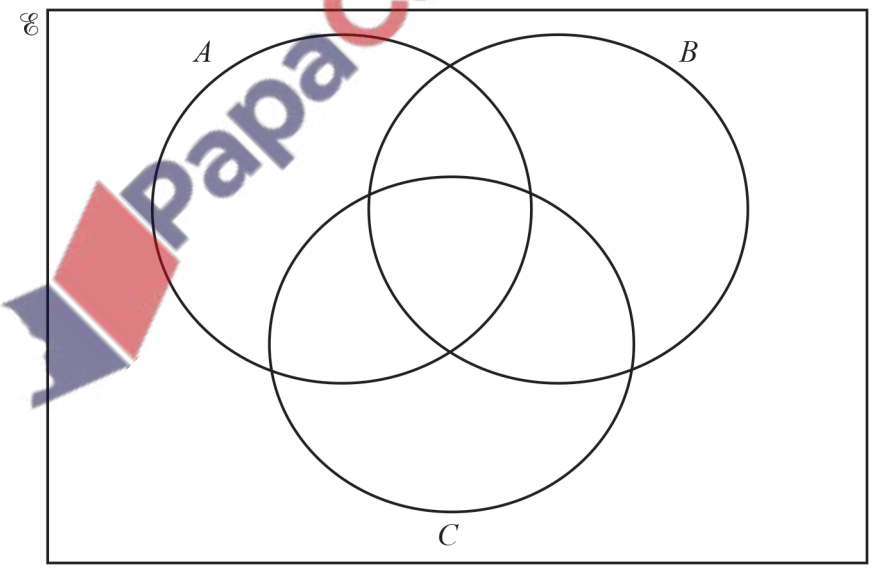
$\mathscr{E} = \{x : 41 \leqslant x \leqslant 50\}$

$A = \{x : x \text{ is an odd number}\}$

$B = \{x : x \text{ is a multiple of } 3\}$

$C = \{x : x \text{ is a prime number}\}$

(a) Complete the Venn diagram to show this information.



[3]

(b) List the elements of

(i) $A \cap C$,

..... [1]

(ii) $(B \cup C)'$.

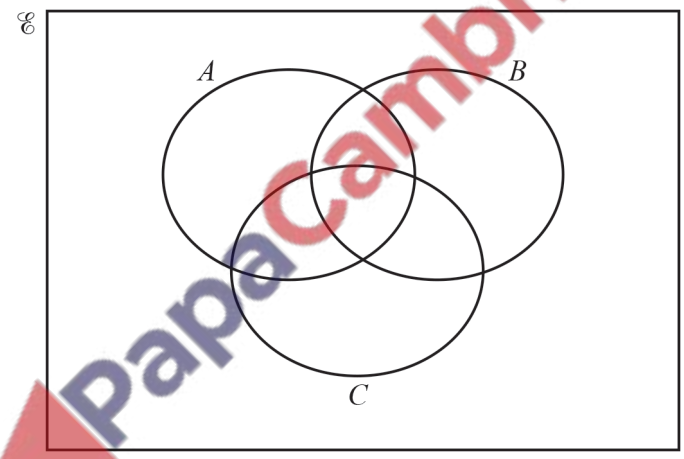
..... [1]

(c) Find $\mathrm{n}(A \cap B \cap C)$.

..... [1]

[Total: 6]

6 In this Venn diagram, shade the region $(A \cup B') \cap C$.



[1]

[Total: 1]

7 Find the value of

(a) $\sqrt[3]{512}$,

..... [1]

(b) $\dfrac{6^8}{2^6}$,

..... [1]

(c) 7^0.

..... [1]

[Total: 3]

8 The average monthly temperatures (°C) in Silvas, Turkey, are shown in the table below.

Month	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Temperature (°C)	−4	−3	2	8	13	17	19	20	16	11	8	−1

(a) Which month is the coldest?

Answer(a) ..... [1]

(b) Work out the difference between the temperature in November and the temperature in December.

Answer(b) ..... °C [1]

(c) Find the median temperature.

Answer(c) ..... °C [2]

(d) Calculate the mean temperature.
Give your answer correct to 2 significant figures.

Answer(d) ..... °C [3]

[Total: 7]

9 Write the recurring decimal $0.\dot{3}\dot{6}$ as a fraction.
Give your answer in its simplest form.
[$0.\dot{3}\dot{6}$means 0.3666…]

..... [3]

[Total: 3]

10 Write these in order of size, starting with the smallest.

$\frac{5}{27}$ 18.4% 1.83×10^{-1} 5^{-1}

..... < ..... < ..... < ..... [2]

[Total: 2]

11 Work out.

$\left(\frac{125}{27}\right)^{-\frac{2}{3}}$

..... [1]

[Total: 1]

12 Luc is painting the doors in his house.

He uses $\frac{3}{4}$ of a tin of paint for each door.

Work out the least number of tins of paint Luc needs to paint 7 doors.

Answer ..... [3]

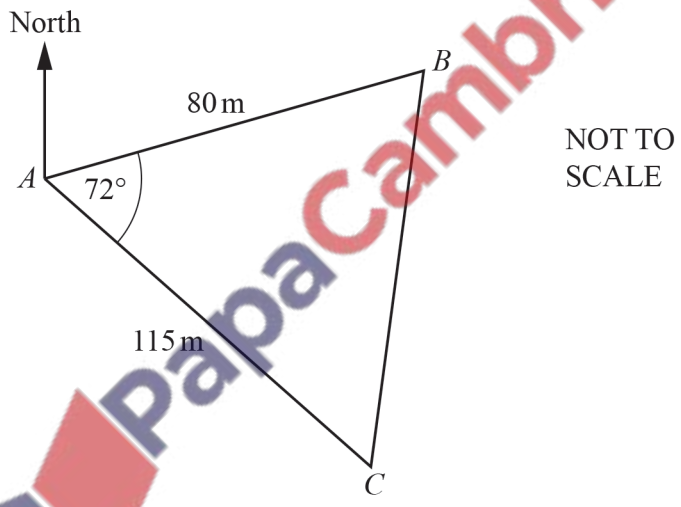
[Total: 3]

13 Write 0.047 883 correct to 2 significant figures.

..... [1]

[Total: 1]

14



The diagram shows the positions of three points A, B and C in a field.

(a) Show that BC is 118.1 m, correct to 1 decimal place.

[3]

(b) Calculate angle ABC.

Angle ABC = ... [3]

(c) The bearing of C from A is 147°.

Find the bearing of

(i) A from B,

..... [3]

(ii) *B* from *C*.

..... [2]

(d) Mitchell takes 35 seconds to run from *A* to *C*.

Calculate his average running speed in kilometres per hour.

..... km/h [3]

(e) Calculate the shortest distance from point *B* to *AC*.

..... m [3]

[Total: 17]

15 A shop sells dress fabric for $2.97 per metre.

(a) A customer buys 9 metres of this fabric.

Calculate the change he receives from $50.

$ ..... [2]

(b) The selling price of \$2.97 per metre is an increase of 8% on the cost price.

Calculate the cost price.

\$ ..... per metre [3]

[Total: 5]

16 The population of a village is 6400.
The population is decreasing exponentially at a rate of r% per year.
After 22 years, the population will be 2607.

Find the value of r.

r = ... [3]

[Total: 3]

17 $P = 2r + \pi r$

Rearrange the formula to write r in terms of P and π.

r = ... [2]

[Total: 2]

18 Factorise completely.

$20x^2 - 45y^2$

..... [3]

[Total: 3]

19 Write $\frac{x}{2} - \frac{2x+4}{x+1}$ as a single fraction, in its simplest form.

..... [3]

[Total: 3]

20 Simplify.

$\left(27x^9\right)^{\frac{2}{3}}$

..... [2]

[Total: 2]

21 Raheem makes baskets and mats.
Each week he makes x baskets and y mats.

He makes fewer than 10 mats.
The number of mats he makes is greater than or equal to the number of baskets he makes.

(a) One of the inequalities that shows this information is $y < 10$.

Write down the other inequality.

..... [1]

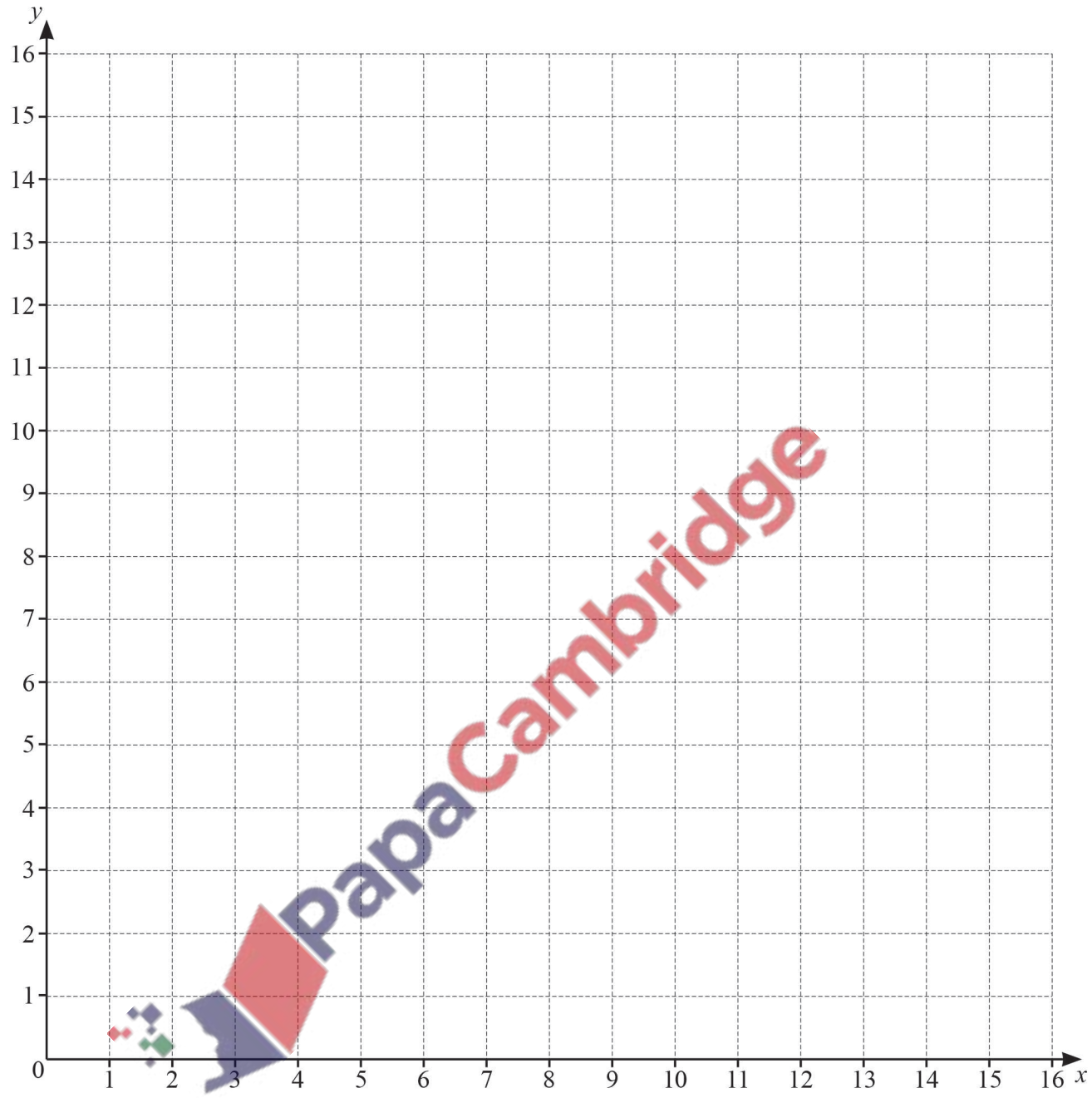
(b) He takes $2\frac{1}{4}$ hours to make a basket and $1\frac{1}{2}$ hours to make a mat.

Each week he works for a maximum of 22.5 hours.

Show that $3x + 2y \leqslant 30$.

[2]

(c) On the grid, draw three straight lines and shade the **unwanted** regions to show these inequalities.



[5]

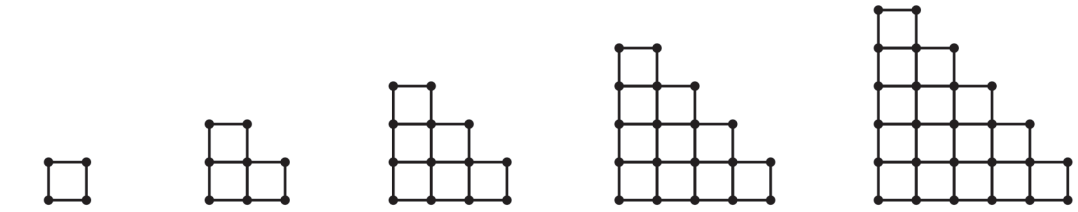
(d) He makes \$40 profit on each basket he sells and \$28 profit on each mat he sells.

Calculate the maximum profit he can make each week.

\$ ..... [2]

[Total: 10]

22



The sequence of diagrams above is made up of small lines and dots.

(a) Complete the table.

	Diagram 1	Diagram 2	Diagram 3	Diagram 4	Diagram 5	Diagram 6
Number of small lines	4	10	18	28		
Number of dots	4	8	13	19		

[4]

(b) For Diagram n find an expression, in terms of n, for the number of small lines.

..... [2]

(c) Diagram r has 10 300 small lines.

Find the value of r.

$r =$ ..... [2]

(d) The number of dots in Diagram n is $an^2 + bn + 1$.

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [2]

[Total: 10]

23 $\mathrm{h}(x) = \dfrac{5x - 1}{3}$

Find $\mathrm{h}^{-1}(x)$.

$\mathrm{h}^{-1}(x) =$ ..... [3]

[Total: 3]

24 A curve has the equation $y = x^3 + 8x^2 + 5x$.

(a) Work out the coordinates of the two turning points.

(..... , ...) and (..... , ...) [6]

(b) Determine whether each of the turning points is a maximum or a minimum.
Give reasons for your answers.

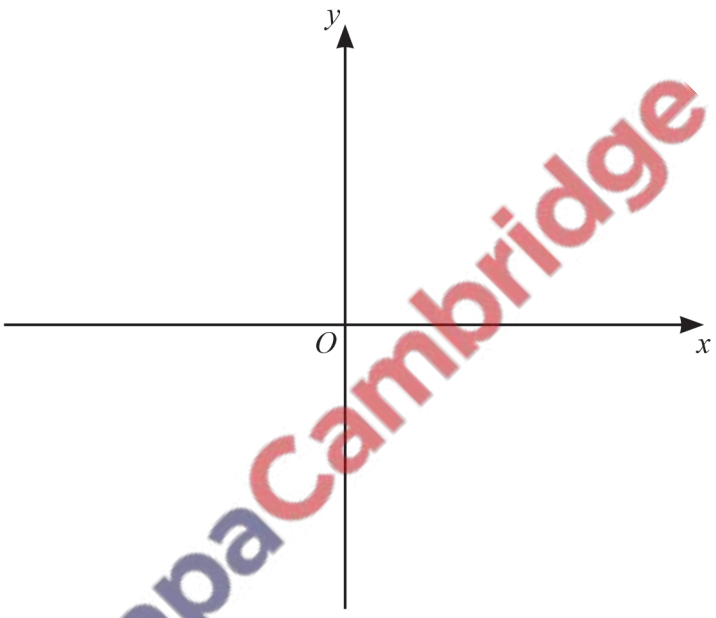
[3]

[Total: 9]

25 **(a)** Write $x^2 + 10x + 14$ in the form $(x + a)^2 + b$.

..... [2]

(b) On the axes, sketch the graph of $y = x^2 + 10x + 14$, indicating the coordinates of the turning point.



[3]

[Total: 5]