

Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Simplify $a^7 \times a^4$

.....
(1)

(b) Simplify $w^{15} \div w^3$

.....
(1)

(c) Simplify $(8x^5y^3)^2$

.....
(2)

(d) Make t the subject of $c = t^3 - 8v$

.....
(2)

(Total for Question 1 is 6 marks)



- 2 Danil, Gabriel and Hadley share some money in the ratios 3:5:9
The difference between the amount of money that Gabriel receives and the amount of money that Hadley receives is 196 euros.

Work out the amount of money that Danil receives.

..... euros

(Total for Question 2 is 3 marks)

- 3 The diagram shows triangle ABC

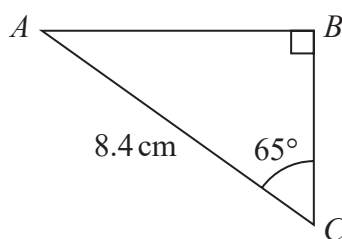


Diagram NOT
accurately drawn

Work out the length of the side AB
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 3 is 3 marks)



4 Sarah makes and sells mugs.

One day she makes 150 mugs.

Her total cost for making these mugs is £1140

Of these mugs

$\frac{2}{5}$ are small mugs

32% are medium mugs

and the rest are large mugs

Here is Sarah's price list for selling each mug.

MUGS	
Small	£8.50
Medium	£11.20
Large	£14.20

Sarah sells all 150 mugs.

Work out her percentage profit.

Give your answer correct to the nearest whole number.

.....%

(Total for Question 4 is 5 marks)



P 6 9 1 9 6 A 0 5 2 8

5 Jenny has six cards.

Each card has a whole number written on it so that

- the smallest number is 5
- the largest number is 24
- the median of the six numbers is 14
- the mode of the six numbers is 8

Jenny arranges her cards so that the numbers are in order of size.

5	24
---	-------	-------	-------	-------	----

- (a) For the remaining four cards, write on each dotted line a number that could be on the card.

(3)

A basketball team plays 6 games.

After playing 5 games, the team has a mean score of 21 points per game.

After playing 6 games, the team has a mean score of 23 points per game.

- (b) Work out the number of points the team scored in its 6th game.

.....
(3)

(Total for Question 5 is 6 marks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

6 (a) Solve the inequality $5x - 7 \leq 2$

.....
(2)

(b) (i) Factorise $y^2 - 2y - 35$

.....
(2)

(ii) Hence, solve $y^2 - 2y - 35 = 0$

.....
(1)

(Total for Question 6 is 5 marks)



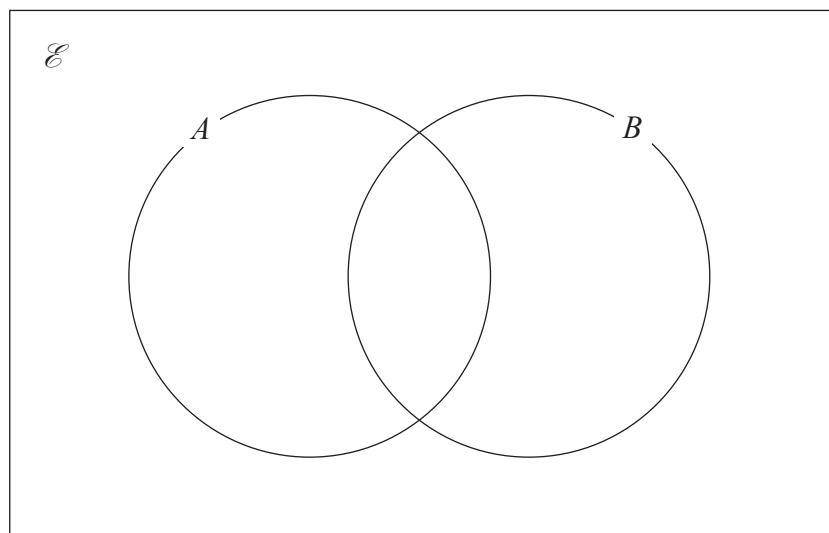
7 $\mathcal{E} = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$

$$A \cap B = \{5, 10, 15\}$$

$$B' = \{7, 8, 9, 11, 12, 13, 14\}$$

$$A' = \{4, 6, 7, 8, 14\}$$

Complete the Venn diagram for this information.



(Total for Question 7 is 3 marks)

8

$$a = 4.2 \times 10^{-24}$$

$$b = 3 \times 10^{145}$$

Work out the value of $a \times b$
Give your answer in standard form.

(Total for Question 8 is 2 marks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

9 The diagram shows isosceles triangle ABC

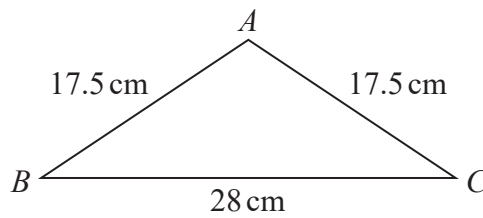


Diagram **NOT** accurately drawn

$$AB = AC = 17.5 \text{ cm}$$

$$BC = 28 \text{ cm}$$

Calculate the area of triangle ABC

..... cm^2

(Total for Question 9 is 4 marks)



10 The straight line **L** has equation $2y + 7x = 10$

(a) Find the gradient of **L**

.....
(2)

(b) Find the coordinates of the point where **L** crosses the y -axis.

(.....,)
(1)

(Total for Question 10 is 3 marks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

11 Himari invests 200 000 yen for 3 years in a savings account paying compound interest.

The rate of interest is 1.8% for the first year and $x\%$ for each of the second year and the third year.

The value of the investment at the end of the third year is 209 754 yen.

Work out the value of x

Give your answer correct to one decimal place.

$x = \dots\dots\dots$

(Total for Question 11 is 3 marks)

