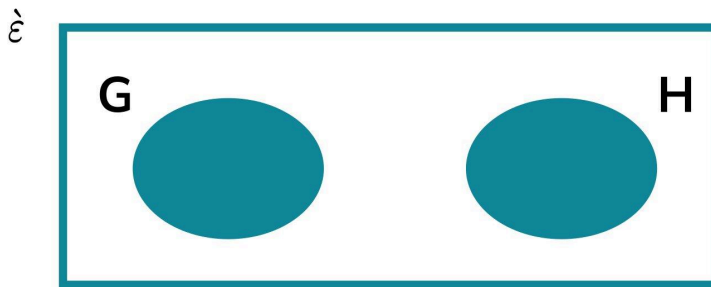


25 GCSE Exam Questions - Worksheet

Grade 4 and Grade 5 style GCSE maths questions

- 1) This diagram represents students in a year group who study Geography (G) or History (H).

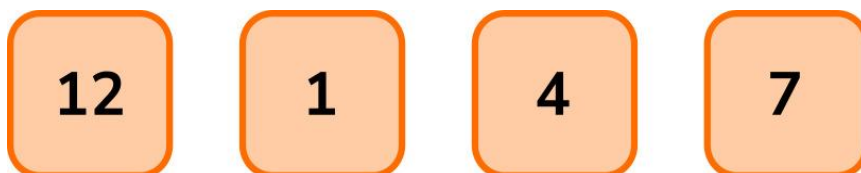


How many students study both Geography and History?

- A) Not enough information to tell
- B) All of them
- C) None of them
- D) Half of them

(1 mark)
Non-calculator

- 2) Sam is using these numbers to make a new number.



- He can only use brackets, +, −, ×, ÷ once.
- He cannot use any number more than once.
- He cannot use powers.
- He cannot put numbers together e.g. he cannot use '147'.

What is the biggest number he can make?

Show how he can make this number.

- A) 144
- B) 132
- C) 336
- D) 51

(2 marks)
Calculator

- 3)** A puma is running with a velocity of 2 m/s.
It then accelerates at 3 m/s² for 5 seconds.

Use the formula

$$v = u + at$$

to work out the final velocity of the puma.

- A) 13 m/s
- B) 17 m/s
- C) 11 m/s
- D) 10 m/s

(2 marks)

4) $\sqrt{3^2 + 4^2} = \sqrt[3]{125b^3}$

Work out the value of b .

- A) 1
- B) 5
- C) 2
- D) 25

(2 marks)
Non-calculator

- 5)** (a) Find the lowest common multiple (LCM) of 30 and 54.

- A) 270
- B) 1620
- C) 6
- D) 540

(2 marks)

(b) Write down the highest common factor (HCF) of A and B .

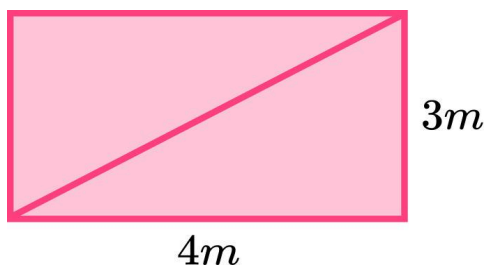
$$A = 2^2 \times 3^2 \times 5 \quad B = 2^2 \times 3 \times 5^2$$

- A) 60
- B) 54000
- C) 900
- D) 120

(1 mark)

Calculator

- 6)** This rectangular frame is made from 5 straight pieces of wood.



The weight of the wood is 2.5 kg per metre.
Work out the total weight of the wood in the frame.

- A) 5 kg
- B) 17.5 kg
- C) 19 kg
- D) 47.5 kg

(5 marks)

Non-calculator

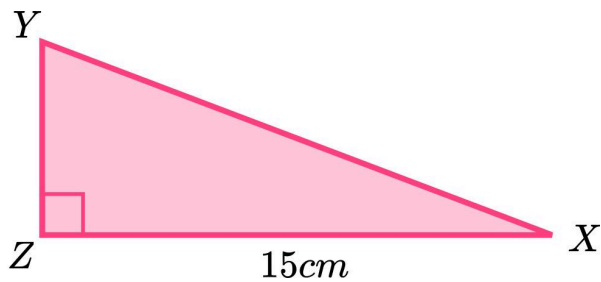
- 7)** The equation of the line L_1 is $y = 5x - 1$.
The equation of the line L_2 is $5y - 25x + 4 = 0$.

Show that these two lines are parallel.

(2 marks)

Non-calculator

- 8) XYZ is a right-angled triangle.



$XZ = 15$ cm.

Angle $Z = 90^\circ$.

Size of angle ZYX : size of angle $YXZ = 3:2$.

Work out the length of XY .

Give your answer correct to 3 significant figures.

- A) 18.5 cm
- B) 12.1 cm
- C) 14.5 cm
- D) 25.5 cm

(4 marks)
 Calculator

- 9) The density of orange juice is 1.02 grams per cm^3 .
 The density of fruit syrup is 1.5 grams per cm^3 .
 The density of lemonade is 0.95 grams per cm^3 .

30 cm^3 of orange juice is mixed with 20 cm^3 of fruit syrup and 150 cm^3 of lemonade to make a drink.

Work out the density of the drink.

Give your answer correct to 2 decimal places.

- A) 3.47 g/cm^3
- B) 203.1 g/cm^3
- C) 1.02 g/cm^3
- D) 0.98 g/cm^3

(4 marks)
 Calculator

25 GCSE Exam Questions - Worksheet

Grade 8 and Grade 9 style GCSE maths questions

- 10)** A straight line graph goes through points (a, b) and (c, d) , where

$$a + 3 = c$$

$$b + 6 = d$$

Find the gradient of the line.

- A) 2
- B) 3
- C) 6
- D) $\frac{1}{2}$

(3 marks)
Non-calculator

- 11)** Use the formula $F = \frac{s}{\sqrt{tm}}$ to find the value of F when

$$s = 6.2 \times 10^9$$

$$t = 4.3 \times 10^8$$

$$m = 3.6 \times 10^{-3}$$

Give your answer in standard form, correct to 2 significant figures.

- A) 5.0×10^6
- B) 4.9×10^2
- C) 4.0×10^4
- D) 4.9×10^4

(3 marks)
Calculator

- 12)** y is inversely proportional to t^2
When $t = 3$, $y = 4$.

t is directly proportional to x^2
When $x = 2$, $t = 8$.

Find a formula for y in terms of x .
Give your answer in its simplest form.

- A) $y = \frac{9}{x^2}$
B) $y = \frac{9}{x^4}$
C) $y = \frac{18}{x^2}$
D) $y = \frac{18}{x^4}$

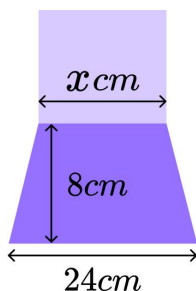
(5 marks)
Non-calculator

- 13)** Make b the subject of the formula $c = \frac{25(a-3b)}{b}$

- A) $b = \frac{cb-25a}{3}$
B) $b = \frac{25a}{c+75}$
C) $b = \frac{a}{c+75}$
D) $b = \frac{cb-25a}{-75}$

(3 marks)
Calculator

- 14)** In the diagram, the square and the trapezium share a common side length of x cm.



The area of the square is equal to the area of the trapezium.

Work out the value of x .

- A) 12 cm
- B) 6 cm
- C) 64 cm
- D) 8 cm

(6 marks)
 Calculator

- 15)** A square with sides of length x mm, is inside a circle.
 Each vertex of the square is on the circumference of the circle.

The area of the circle is 64 mm^2 .

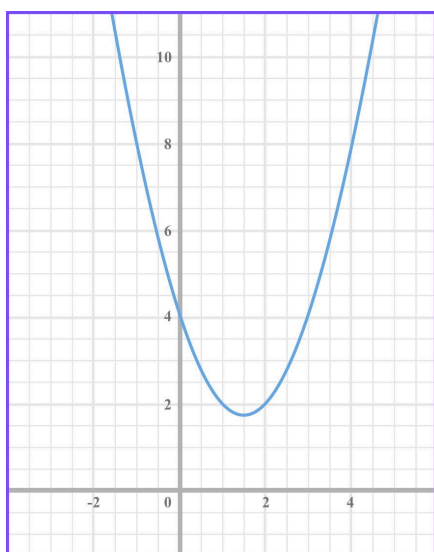
Work out the value of x .

Give your answer correct to 3 significant figures.

- A) 4.51 mm
- B) 20.35 mm
- C) 6.38 mm
- D) 40.74 mm

(4 marks)
 Calculator

- 16)** The diagram shows part of the graph $y = x^2 - 3x + 4$.



- (a)** By drawing a suitable line, use your graph to find estimates for the solutions of

$$x^2 - 2x - 1 = 0.$$

(2 marks)

P is a point of the graph $y = x^2 - 3x + 4$ where $x = 4$.

(b) Calculate an estimate for the gradient of the graph at the point P .

(3 marks)

17) The n th of a sequence is given by $an^2 + bn$ where a and b are integers.

The 3rd term of the sequence is 3.

The 6th term of the sequence is 42.

Find the 5th term of the sequence.

A) 29

B) 5

C) 25

D) 18

(4 marks)

18) (a) Factorise $d^2 - e^2$

(1 mark)

(b) Hence, or otherwise, simplify fully $(x^2 + 8)^2 - (x^2 - 4)^2$

A) $(x + 8)(x - 4)$

B) $x^2 + 12$

C) $x^2 + 4$

D) $24x^2 + 48$

(3 marks)
Calculator

19) Show that $\frac{2\sqrt{14}}{\sqrt{5}} - \frac{\sqrt{7}}{\sqrt{10}}$ can be written in the form $\frac{a\sqrt{b}}{10}$

Where a and b are integers.

- A) $\frac{3\sqrt{7}}{10}$
- B) $\frac{3\sqrt{70}}{10}$
- C) $\frac{2\sqrt{7}}{10}$
- D) $\frac{\sqrt{7}}{\sqrt{10}}$

(3 marks)

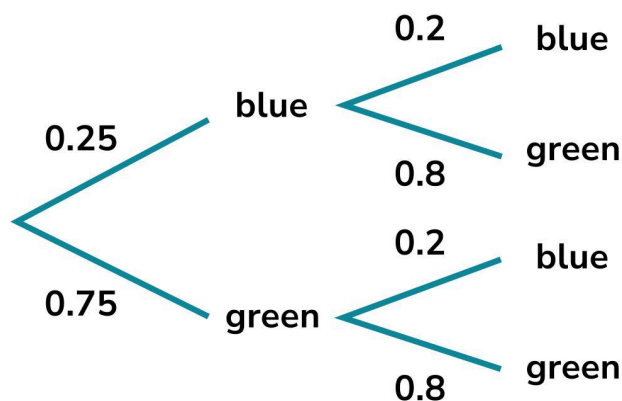
Non-calculator

20) David has two spinners, spinner **A** and spinner **B**.
Each spinner can only land on blue or green.

The probability that spinner **A** will land on blue is 0.25.

The probability that spinner **B** will land on green is 0.8.

The probability tree diagram shows this information.



David spins spinner **A** and spinner **B** together.
He does this a number of times.

The number of times **both** spinners land on blue is 40.

Work out an estimate for the numbers of times **both** spinners land on green.

- A) 800
- B) 64
- C) 128
- D) 480

(3 marks)
Calculator

21) Solve $\frac{4x+1}{4} - \frac{2x+1}{3} = \frac{1-x}{6}$

- A) $x = 0.5$
- B) $x = -0.5$
- C) $x = -5$
- D) $x = 12$

(4 marks)
Calculator

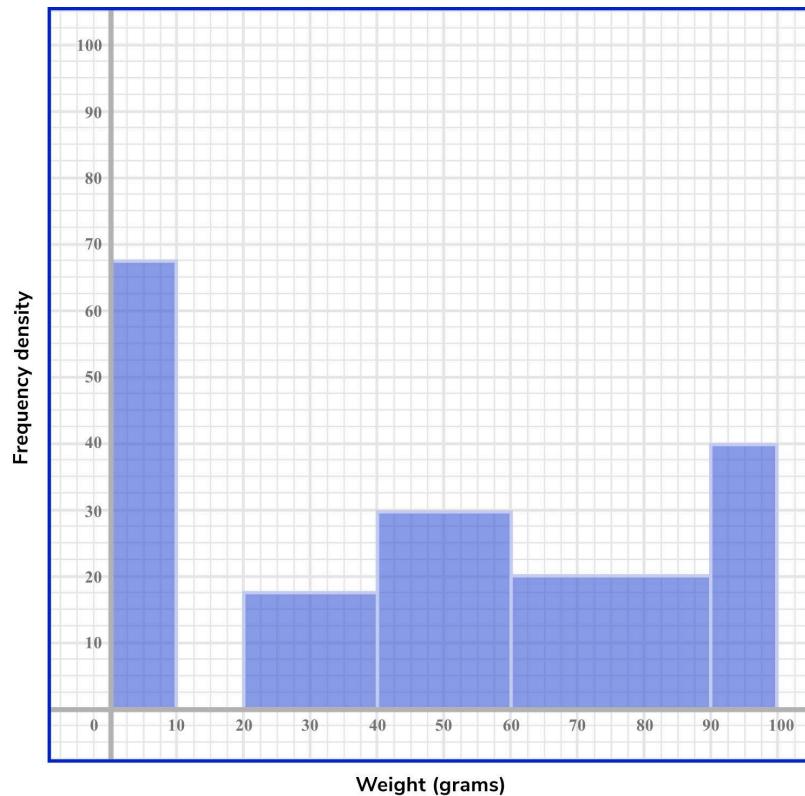
22) $2 - \frac{x+2}{x-3} - \frac{2x-5}{x+3}$ can be written as a single fraction in the form $\frac{ax^2+bx+c}{x^2-9}$

Where a and b are integers.

Work out the value of a and the value of b and c .

(4 marks)
Calculator

- 23)** The histogram shows information about the weights of some letters handled by a delivery company in one week.



Sam says, "There are more letters weighing between 20 g and 60 g than letters weighing between 60 g and 100 g."

Is Sam correct?

Show how you decide.

(4 marks)
Calculator

24) 60 people were asked if they spoke French, German or Italian.

Of these people,

21 speak French

1 speaks French, German and Italian

4 speak French and Italian but not German

7 speak German and Italian

18 do not speak any of the languages

All 11 people who speak German speak at least one other language.

Two of the 60 people are chosen at random. Work out the probability that they both only speak French.

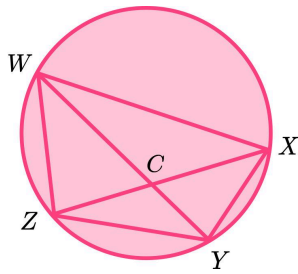
A) $\frac{12}{60}$

B) $\frac{13}{295}$

- C) $\frac{1}{25}$
D) $\frac{11}{295}$

(5 marks)
Calculator

- 25)** W, X, Y and Z are four points on the circumference of a circle.



WCY and XCZ are straight lines.

Prove that triangle CWX and triangle CYZ are similar.
You must give reasons for each stage of your working.

(3 marks)
Calculator

25 GCSE Exam Questions - Answers

Grade 4 and Grade 5 style GCSE maths questions

Question			Answer	
1)		Venn diagrams	C) None of them	(1)
2)		Order of operations (BIDMAS)	B) 132	(2)
3)		Formulae	B) 17 m/s	(2)
4)		Solving equations	A) 1	(2)
5)	(a)	Lowest common multiple and highest common factor	A) 270	(2)
	(b)	Lowest common multiple and highest common factor	A) 60	(1)
6)		Pythagoras' theorem	D) 47.5 kg	(5)
7)		Parallel lines	Rearrange L_2 to make y the subject. $5y - 25x + 4 = 0$ $5y = 25x - 4$ $y = 5x - \frac{4}{5}$ L_1 and L_2 have the same gradient so they are parallel.	(2)
8)		Trigonometry	A) 18.5 cm	(4)
9)		Density	C) 1.02 g/cm ³	(4)

25 GCSE Exam Questions - Answers

Grade 8 and 9 style GCSE maths questions

Question			Answer	
10)		Straight line graphs	A) 2	(3)
11)		Standard form	A) 5.0×10^6	(3)
12)		Direct and inverse proportion	B) $y = \frac{9}{x^4}$	(5)
13)		Rearranging formulae	B) $b = \frac{25a}{c+75}$	(3)
14)		Quadratic equations	A) 12 cm	(6)
15)		Area of a circle	C) 6.38 mm	(4)
16)	(a)	Quadratic graphs	$x = 2.4, -0.4$	(2)
	(b)	Quadratic graphs	Answers around 4	(3)
17)		Nth term	C) 25	(4)
18)	(a)	Factorising	$(d + e)(d - e)$	(1)
	(b)	Factorising	D) $24x^2 + 48$	(3)
19)		Surds	B) $\frac{3\sqrt{70}}{10}$	(3)
20)		Tree diagrams	D) 480	(3)
21)		Algebraic fractions	A) $x = 0.5$	(4)
22)		Algebraic fractions	$a = -1$ $b = 6$ $c = -39$	(4)
23)		Histograms	Sam is wrong. Number of letters between 20 g and 60 g $= 20 \times 17.5 + 20 \times 30 = 950$	(4)

			Number of letters between 60 g and 100 g $= 30 \times 20 + 10 \times 40 = 1000$	
24)		Venn diagram	D) $\frac{11}{295}$	(5)
25)		Circle theorems	Angle WXC = Angle CYZ because angles in the same segment are equal. Angle XWC = Angle CZY because angles in the same segment are equal. Angle WCX = Angle ZCY because vertically opposite angles are equal. (We only need two of these angles as we can calculate the third by using the fact that angles in a triangle add to 180 degrees.)	(3)