

Numbers – GCSE Mathematics

1. No.1

Work out $12^2 \div \left(\frac{1}{3} \times \sqrt{36}\right)$

[3 marks]

$$12^2 \div \left(\frac{1}{3} \times \sqrt{36}\right)$$

$$144 \div \frac{1}{3} \times 6$$

$$144 \div 2 =$$

$$\begin{array}{r} 72 \\ 2 \overline{)144} \\ \underline{14} \\ 04 \\ \underline{04} \\ 0 \end{array}$$

$$= \underline{\underline{72}}$$

Answer 72

2. No.4

The attendance for a rugby match is 8400 people to the nearest 100

(a) Write down the minimum possible attendance.

$$\text{Limit} = \frac{100}{2} = 50$$

$$\text{Lower bound} = 8400 - 50 = 8350 \quad [1 \text{ mark}]$$

Answer 8350

(b) Write down the maximum possible attendance.

$$\text{Maximum} = 8449$$

[1 mark]

Answer 8449

3. No.5

A school year has 78 students.

28 wear glasses.

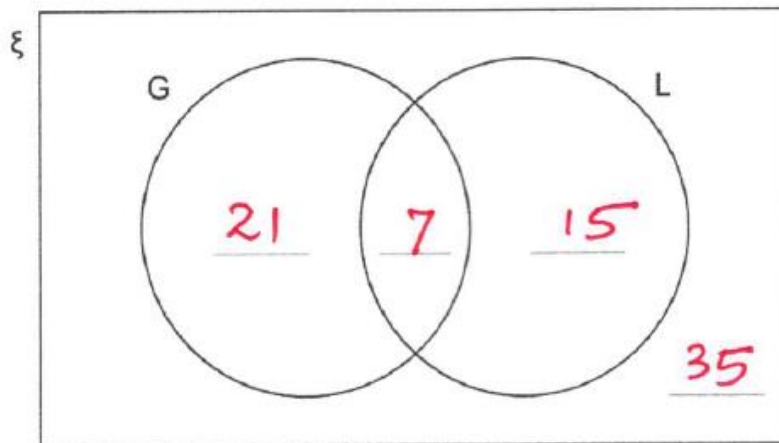
 $\frac{1}{4}$ of the students who wear glasses are left-handed.30% of the students who do **not** wear glasses are left-handed.(a) ξ = students in the school year

G = wears glasses

L = left-handed

$$\frac{1}{4} \times 28 = 7 \text{ (Left handed.)}$$

$$\frac{30}{100} \times 50 = 15$$



Complete the Venn diagram.

[3 marks]

$$78 - 28 = 50$$

$$21 + 7 + 15 = 43$$

$$78 - 43 = 35 \text{ (Wear no glasses)}$$

(b) A left-handed student is chosen at random.

Work out the probability that the student wears glasses.

[1 mark]

$$\text{Number Wear glasses} = 7 + 15 = 22$$

$$P(\text{Glasses}) = \frac{7}{22}$$

Answer

$$\frac{7}{22}$$

4. No.15

- (a) Between which two
- consecutive**
- integers does the square root of 210 lie?

[1 mark]

$$\sqrt{196} = 14$$

$$\sqrt{225} = 15$$

$$\sqrt{169} = 13$$

$$\sqrt{196} < \sqrt{210} < \sqrt{225}$$

$$14 < \sqrt{210} < 15$$

Numbers = 14 and 15.

Answer 14 and 15

- (b) Here are two calculations, A and B.

A

$$1.92^7 + 6.9^3$$

B

$$5 \times \sqrt[3]{1000\ 350}$$

Use approximations to show that answer to A < answer to B

[3 marks]

A

$$1.92 \approx 2.0, 6.9 \approx 7$$

A-approximations are:

$$= 2^7 + 7^3$$

$$= 128 + 343$$

$$= \underline{\underline{471}}$$

$$\begin{array}{r}
 7 \times 7 \times 7 \\
 = \underline{\underline{343}} \\
 128 \\
 + 343 \\
 \hline
 471
 \end{array}$$

B.

$$5 \times \sqrt[3]{1000\ 000}$$

$$5 \times 100 =$$

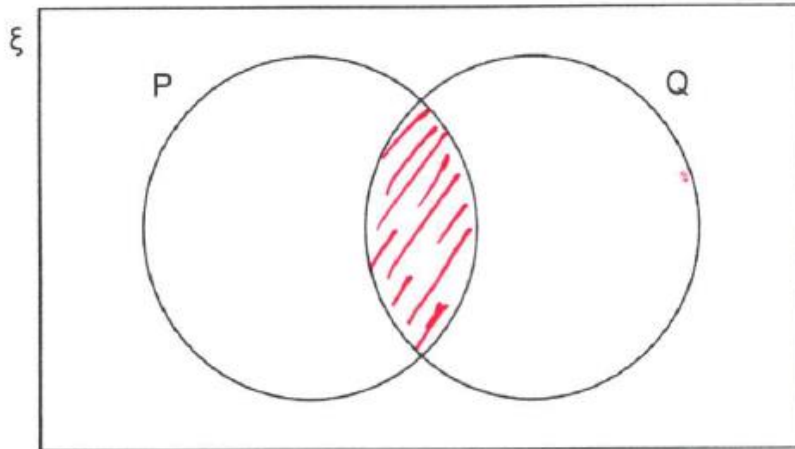
$$= 500$$

$$100 \times 100 \times 100 = 10^6$$

$$471 < 500$$

A is less than B.

5. No.9

On the Venn diagram, shade the section represented by $P \cap Q$ 

✓ Intersection [1 mark]
(both in P and Q.)

6. No.11

A map has a scale of 1 : 20 000

Two churches are 15 cm apart on the map.

Work out the actual distance between them.

Give your answer in kilometres.

[3 marks]

Scale: 1 : 20,000

15 cm = ?

 $15 \times 20,000$ $= 300,000 \text{ cm}$

Convert the cm to km

 $1 \text{ km} = 100,000 \text{ cm}$ $? = 300,000 \text{ cm}$ $\frac{300,000}{100,000} = \underline{\underline{3 \text{ km}}}$

Answer

3

km

7. No.15

Concrete from a truck is poured at 10.9 kg per second for 30 minutes.

$$1000 \text{ kg} = 1 \text{ tonne}$$

Is more than 20 tonnes of concrete poured?

Tick a box.

Yes

☐

No

☒

You **must** show your working.

[4 marks]

$$\begin{aligned} \text{Time in Seconds} &= 30 \text{ mins} \times 60 \text{ s} \\ &= \underline{1800 \text{ seconds}} \end{aligned}$$

$$10.9 \text{ kg} \rightarrow 1 \text{ second}$$

$$? \rightarrow 1800 \text{ seconds}$$

$$10.9 \times 1800 = \underline{\underline{19620 \text{ kg}}}$$

$$1000 \text{ kg} = 1 \text{ tonne}$$

$$19620 \text{ kg} = ?$$

$$\frac{19620}{1000} = \underline{\underline{19.62 \text{ tonnes}}}$$

19.62 tonnes is $<$ than 20 tonnes.

8. No.11

Write a number in each box to make the calculations correct.

[2 marks]

$$\boxed{10} \div \boxed{-2} \times \boxed{-1} = \boxed{5}$$

$$\boxed{\frac{1}{3}} \times \boxed{4\pi} \times \boxed{6} = \boxed{8\pi}$$

$$10 \div -2 = -5$$

$$-5 \times -1 = \underline{\underline{5}}$$

$$\frac{1}{3} \times x \times 6 = 8\pi \quad (\text{Let missing value be } x)$$

$$\frac{2x}{2} = \frac{8\pi}{2}$$

$$x = \underline{\underline{4\pi}}$$

9. No.22

Fatima is choosing a 4-digit code.

Each digit is a whole number from 0 to 9

She decides

all her digits will be odd numbers

no digits will be repeated.

How many different codes can she make?

[2 marks]

1, 3, 5, 7, 9

Possible ways = $5 \times 4 \times 3 \times 2$

= 120 different ways

Answer

120