# GCSE MATHEMATICS

S21-C300

## With Calculator Assessment Resource B

Foundation Tier

**Formula list**

*Area and volume formulae*

Where $r$ is the radius of the sphere or cone, $l$ is the slant height of a cone and $h$ is the perpendicular height of a cone:

Curved surface area of a cone = $\pi rl$

Surface area of a sphere = $4\pi r^2$

Volume of a sphere = $\frac{4}{3}\pi r^3$

Volume of a cone = $\frac{1}{3}\pi r^2 h$

*Kinematics formulae*

Where $a$ is constant acceleration, $u$ is initial velocity, $v$ is final velocity, $s$ is displacement from the position when $t = 0$ and $t$ is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

**1.** *(a)* Write the number 20 056 in words. [1]

Twenty thousand and fifty-six

*(b)* Here is an inequality.

$8 > 5$

Write in words what this inequality means. [1]

8 is bigger than 5

*(c)* Here are some number cards.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|

(i) Arrange five of these cards to make a 5-digit number so that there is:
- a 6 in the hundreds place,
- a 4 in the tens place.

Write your 5-digit number on the cards below. [1]

| 1 | 2 | 6 | 4 | 5 |
|---|---|---|---|---|

(ii) Multiply your answer to (i) by 10.
What is the new place value of the 6? [1]

126450 6 is Thousands

*(d)* Which of the fractions below has the same value as the 3 in 0·9375?
Circle your answer. [1]

$\frac{3}{10}$ $\frac{3}{1000}$ $\frac{3}{1}$ $\frac{3}{100}$ $\frac{3}{9}$

0.0300

**2.** *(a)* Calculate 56% of 850. [2]

56/100 × 850 = 476

*(b)* Anoosha tries to calculate 7% of

1250. She writes the following:

| | |
|---|---|
| | |
| | 7% of 1250 = 0·7 × 1250 |
| | |
| | = 875 |
| | |
| | |
| | |

Anoosha is incorrect.
What should she have written? [1]

0.07 × 1250 = 87.5

*(c)* Dieter slept very well last

night. He says,

"I slept for 9 out of 24 hours, that's over 36% of a day."

Is Dieter correct?

Yes ☑ No ☐

Give a reason for your answer.
You must show all your working. [2]

9/24 × 100 = 37.5%

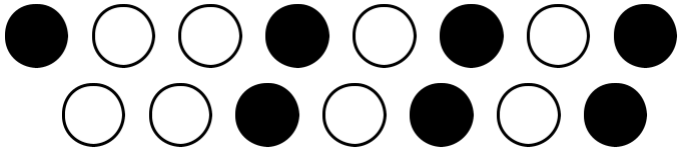
37.5 ≠ 36

**3.** *(a)* The diagram below shows a piece of string, *AB*, that is 8 cm long.
The string is to be cut into two pieces in the ratio 1 : 3.

How far from *A* should the cut be made? [1]


Cut should be made ……2…… cm from *A*.

*(b)* The diagram below shows black and white counters.



Use the diagram to help you answer these questions.

(i) What fraction of the counters are black? [1]

7/15

(ii) What is the ratio of the number of black counters to the number of white counters? [1]

B:W is 7:8

(iii) What is the smallest number of extra black and white counters that need to be added to the diagram above so that the ratio of black counters to white counters is 2 : 3? [2]

B:W is 7:8 so need to get to 8:12
so 1 more black and 4 more white

Extra black ……1…… Extra white ……4……

*(c)* £85.75 is being shared between Zayn and Edith in the ratio 3 : 4.

How much money would each of them get? [3]

3+4=7 parts 85.75 ÷ 7 = 12.25 each part

2 : £ 2 : £

(3×12.25) : (4×12.25) → £36.75 £49

**4.** Dave is thinking of a number.
The number is:

- greater than 200,
- less than 300,
- a square number,
- a multiple of 5.

What number is Dave thinking of? [2]

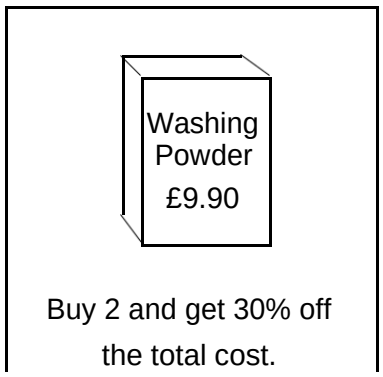
225 > 200 ✓
225 < 300 ✓
$\sqrt{225} = 15$ ✓
225 ÷ 5 = 45 ✓

Dave is thinking of the number 225

**5.** Shops A and B both sell identical boxes of washing powder.
Shop A sells boxes of washing powder at a discount of 30% when two boxes are bought.
Shop B sells the same boxes of washing powder in a 'Buy one, get the second half price' deal.

The two shops display these posters:

Shop A




Shop B


Does shop A or shop B offer the better value for money when buying two boxes?
Show how you decide. [5]

Shop A → (2 × 9.90 × 0.7) = £13.86

Shop B → $9.2 + \frac{9.2}{2}$ = £13.80.

13.80 < 13.86 so shop B is better value.

**6.** *(a)* Calculate

$$\frac{2.4^2}{3\times5.1}$$

Give your answer correct to 2 decimal places. [2]

32/85 → 0.38

*(b)* Calculate $(1{\cdot}8 \times 10^6) \times (2{\cdot}5 \times 10^8)$ giving your answer in standard form. [1]

$4.5 \times 10^{14}$

**7.** The rectangle below has a length of 12 cm and an area of 54 $cm^2$.

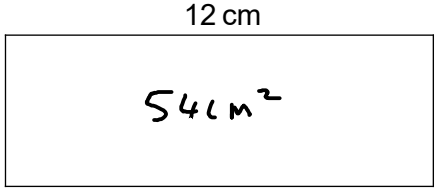



*Diagram not drawn to scale*

The rectangle is enlarged by a scale factor of 3.

Calculate the width of the enlarged rectangle. [3]

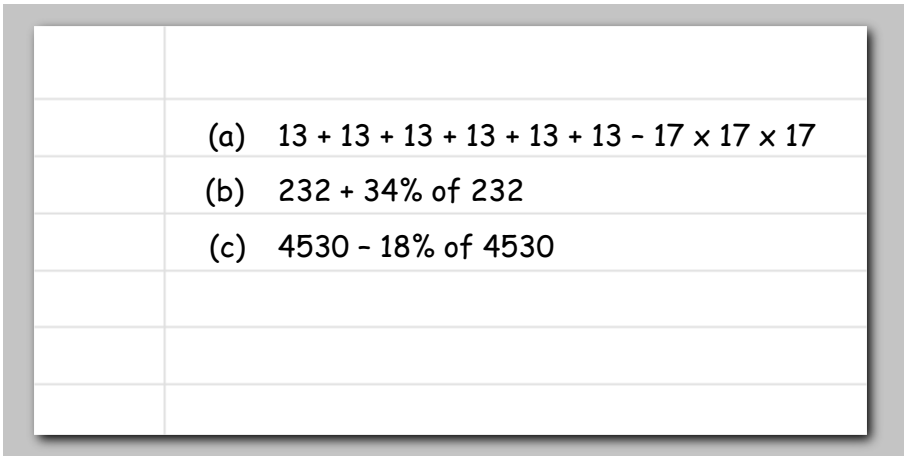
Original rectangle width = 54/12 = 4.5cm

Enlarge by ×3 → 4.5 × 3 = 13.5cm

**8.** Harman has written some calculations he needs to work out for his homework.

Write down the calculation needed to work out each of the following using the fewest number of key presses. [4]

Give your answer to each question.




*(a)* $(5 \times 13) - (17)^3$

Answer: $-4848$

*(b)* $1.34 \times 232$

Answer: $310.88$

*(c)* $0.82 \times 4530$

Answer: $3714.6$

**9.** This motorcycle depreciates by 16% per annum.

**Motorcycle now worth £2500**

After how many whole years will this motorcycle be worth less than £1000?
You must show all your working. [3]

Depreciates by 16% so multiplier = (1 − 0.16) = 0.84

1 year → £2500 × 0.84 = £2100

2 year → £2100 × 0.84 = £1764

3 year → £1764 × 0.84 = £1481.76

4 year → £1481.76 × 0.84 = £1244.6784

5 year → £1244.6784 × 0.84 = £1045.529856

6 year → £1045.529856 × 0.84 = £878.245079

Motorcycle will be worth less than £1000 after ..... 6 ..... whole years.