

Maths Formulae and Methods

A formula bank, choosing the right method, and practice using area, volume, circle, mean, percentage, speed and Pythagoras.

Name _____ Date _____ Class _____

Learning objective: I can choose and use the correct formula or method to solve a problem.

✓ I can recall key formulae ✓ I can choose a method ✓ I can substitute accurately

1 Formula bank Learn these. Cover them up and test yourself.

Area of a rectangle $A = l \times w$	Area of a triangle $A = \frac{1}{2} \times b \times h$	Area of a circle $A = \pi r^2$
Circumference $C = \pi d$	Volume of a cuboid $V = l \times w \times h$	Mean total $\div$ number of values
Percentage change change $\div$ original $\times 100$	Pythagoras' theorem $a^2 + b^2 = c^2$	Speed distance $\div$ time

2 Which method? Match each problem to the formula you would use.

1 finding the space inside a box	☐	A $a^2 + b^2 = c^2$
2 finding the distance round a circular pond	☐	B change $\div$ original $\times 100$
3 finding a missing side of a right-angled triangle	☐	C $V = l \times w \times h$
4 finding how much a salary has risen by in %	☐	D total $\div$ number of values
5 finding the average score in a test	☐	E $C = \pi d$

3 Use the formulae Show your working.

1 Rectangle 12 cm by 7 cm. Find the area. Answer	2 Triangle: base 9 cm, height 8 cm. Find the area. Answer
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4 Use the formulae (continued) Show your working.

1 Circle: radius 6 cm. Find the area ($\pi = 3.14$).

Answer

2 Circle: diameter 14 cm. Find the circumference ($\pi = 3.14$).

Answer

3 Cuboid 8 cm $\times$ 5 cm $\times$ 2 cm. Find the volume.

Answer

4 Find the mean of 4, 9, 7, 12, 8.

Answer

5 A price rises from £50 to £65. Find the percentage increase.

Answer

6 A car travels 150 km in 2.5 hours. Find its average speed.

Answer

7 A right-angled triangle has shorter sides 5 cm and 12 cm. Find the hypotenuse.

Answer

8 A right-angled triangle has hypotenuse 10 cm and one side 6 cm. Find the other side.

Answer

5 Methods

1 Solve $4x - 9 = 23$. Write each step and the inverse operation you used.

2 Explain the mistake: 'The area of a circle with radius 3 cm is $\pi \times 6 = 18.84 \text{ cm}^2$.'

Answer Key

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Question	Answers
2 Which method?	1 C; 2 E; 3 A; 4 B; 5 D
3 Use the formulae	1 84 cm ² ; 2 36 cm ²
4 Use the formulae (continued)	1 113.04 cm ² ; 2 43.96 cm; 3 80 cm ³ ; 4 8; 5 30%; 6 60 km/h; 7 13 cm; 8 8 cm
5 Methods	1. add 9 to both sides: $4x = 32$; divide both sides by 4: $x = 8$ 2. They used the diameter/doubled the radius instead of squaring it: $A = \pi \times 3^2 = 3.14 \times 9 = 28.26 \text{ cm}^2$.

Teaching note: $\pi = 3.14$ is used so answers can be checked without a calculator; accept answers using the π button if pupils state they used it. Pythagoras questions are Year 9 content.