


Outcome 1 - Formulae in Context

Bronze example

Examples...



The cost for delivering pizzas is calculated using the formula:

$$C = 7 + 6.5P$$

where C is the cost (in pounds) and P is the number of pizzas ordered.


How much would it cost to have 8 pizzas delivered?

****Sub into formula! ****

$$C = 7 + 6.5 \times 8 = \text{£}59$$

Silver example

Examples...



The formula for calculating the area of a rhombus is given as:

$$A = \frac{1}{2} \times D_1 \times D_2$$

where A is the area and D_1 and D_2 are the two diagonals.


What is the area of a rhombus where $D_1 = 8$ cm and $D_2 = 6$ cm?

****Sub into formula! ****

$$A = \frac{1}{2} \times 8 \times 6 = 24 \text{ cm}^2$$

Gold example

Examples... ****Sub into formula! ****



The body mass index, B , of a person who weighs w kilograms and whose height is h metres is given by the formula

$$B = \frac{w}{h^2}$$

Calculate the value of B for a person who weighs 68 kilograms and is 1.49 metres tall.

$$B = 68 \div 1.49^2 = 30.629 \dots = 30.6$$

Bronze Questions

- 1 The cost for hiring a taxi is given by the formula:

$$F = 3 + 4M$$

where F is the fare (in pounds) and M is the number of miles travelled.

How much would it cost for a journey of 5 miles?

- 2 The cost for hiring a car is given by the formula:

$$C = 30 + 15D$$

where C is the cost (in pounds) and D is the number of days hired.

How much would it cost to hire a car for 4 days?

- 3 A chicken is to be cooked by using the formula:

$$T = 40K + 20$$

where T is the time (in minutes) and K is the weight of the chicken in kilograms.

How long would it take to cook a 4 kilogram chicken?

- 4 A mobile phone bill is calculated by the formula:

$$B = 0.25M + 0.11T$$

where B is the bill (in pounds), M is the minutes used and T is the number of texts.

How much would it cost for 59 minutes and 24 texts?

Silver Questions

- 1 The formula for calculating the area of a rectangle is given as:

$$A = L \times B$$

where A is the area, L is the length and B is the breadth.

What is the area of a rectangle with $L = 9$ cm and $B = 6$ cm?

- 2 The formula for the perimeter of an equilateral triangle is given as:

$$P = 3L$$

where P is the perimeter, and L is the length of a side.

What is the perimeter of a equilateral triangle with $L = 5$ m?

- 3 The formula for calculating the volume of a cube is given as:

$$V = L^3$$

where V is the volume, and L is the length.

What is the volume of a cube when $L = 4$ mm?

- 4 The formula for calculating the area of a triangle is given as:

$$A = \frac{1}{2} \times B \times H$$

where A is the area, B is the base and H is the height.

What is the area of a triangle with $B = 4$ cm and $H = 7$ cm?

Gold Questions

Evaluate the following scientific formulae...

- 1 The distance, S metres, travelled by a falling object in t seconds is given by the formula

$$S = \frac{1}{2}gt^2$$

Calculate the value of S when $g = 10.5$ and $t = 11$.

- 2 The velocity, v metres per second, at the top of a loop in a roller coaster is given by the formula

$$v = \sqrt{gr}$$

where r metres is the radius of the loop. Calculate the value of v when $g = 5.03$ and $r = 6$.



- 3 The formula to calculate energy, E , is

$$E = mc^2$$

where m is the mass and c is the speed of light.

Calculate the value of E when $m = 44$ and $c = 300\,000\,000$.

- 4 The current, I , is calculated by the formula

$$I = \sqrt{\frac{P}{R}}$$

where P is the power and R is the resistance.

Find the current, I , when there is a power of 70 and a resistance of 8.

Bronze Answers

1. £23
2. £90
3. 180 minutes
4. £17.39

Silver Answers

1. 54 cm^2
2. 15 m
3. 64 mm^3
4. 14 cm^2

Gold Answers

1. 635.25
2. 3.96×10^{18}
3. 5.49
4. 2.96