

Q1

1a

Substitute $m = 50$ and $h = 1.57$ into the formula

$$B = \frac{50}{1.57^2}$$

[]

Work out this value (using a calculator)

$$B = 20.2847\dots$$

Round this answer to 1 decimal place

20.3 []

1b

We need to find m Substitute $h = 1.80$ and $B = 21$ into the formula

$$21 = \frac{m}{1.80^2}$$

Get m on its own (by multiplying both sides by 1.80^2)

$$21 \times 1.80^2 = m$$

[]

Work out this value (using a calculator)

$$m = 68.04$$

68.04 kg []

Q2

2

Substitute $A = 100$ and $b = 2$ into the formula

$$100 = 4 \times 2 \times c$$

[]

Simplify the equation (using $4 \times 2 = 8$)

$$100 = 8c$$

Find c (by dividing both sides by 8)

$$\frac{100}{8} = c$$

 $c = 12.5$ []

Q3

3

Find the temperature in °C (by substituting $F=77$ into the formula)

$$C = \frac{5(77 - 32)}{9}$$

[]

Find the value of C

$$C = 25$$

[]

Compare this value of C to the minimum temperature of 20°C

$$25 > 20$$

Write a clear conclusion that answers the exact question being asked

Mrs Smith's home is 25°C , which is not lower than the minimum temperature of 20°C as $25 > 20$ []

Q4

4

Substitute $x=0.7$ into the formula

$$\frac{(0.7 + 1)^2}{2 \times 0.7}$$

[]

Work out this value (using a calculator)
Show all the figures on your calculator display

2.06428574... []

Seeing "2.064" gets full marks (as does $\frac{289}{140}$)

Q5

5a

Substitute $t=5$ into the formula

$$h = 3 \times 5^2$$

[]

Find h (using $5^2 = 5 \times 5 = 25$)

$$h = 3 \times 25$$

$h = 75$ []

5b

Substitute $h=108$ into the formula

$$108 = 3t^2$$

Get t^2 on its own (by dividing both sides by 3)

$$\frac{108}{3} = t^2$$

[]

Use a non-calculator method for division (or know that $3 \times 36 = 108$)

$$36 = t^2$$

Find t (by taking square roots of both sides and including a \pm sign)

$$\pm\sqrt{36} = t$$

Use that $\sqrt{36}$ is 6 (from $6^2 = 6 \times 6 = 36$)

$$t = \pm 6 \quad []$$

5c

Get the a term on its own (by subtracting u from both sides)

$$v - u = at$$

[]

Get a on its own (by dividing both sides by t)

$$\frac{v - u}{t} = a$$

$$a = \frac{v - u}{t} \quad []$$

Q6

6

i) Substitute $t = -2$ into the formula (putting brackets around the negative number)

$$h = 5 \times (-2)^2 + 2$$

$$h = 22 \quad []$$

ii) The formula has h as the subject, but we need t
Substitute $h = 47$ into the formula

$$47 = 5t^2 + 2$$

Get $5t^2$ on its own (by subtracting 2 from both sides)

$$47 - 2 = 5t^2$$

Get t^2 on its own (by dividing both sides by 5)

$$\frac{47 - 2}{5} = t^2$$

[]

Get t^2 on its own (by dividing both sides by 5)

$$\frac{47-2}{5} = t^2$$

Find the value of t^2

$$9 = t^2$$

Find t (by taking square roots of both sides and including a \pm sign)

$$t = \pm\sqrt{9}$$

$t = \pm 3$

Q7-8

7

Substitute "-2" for "y" in the (right-hand side of the) formula.

If using your calculator it is good practice to put negative numbers in brackets.

$$w = 5(-2)^2 - (-2)^3$$

$$\begin{aligned} w &= 5 \times 4 - (-2)^3 \\ &= 20 - (-8) \\ &= 20 + 8 \\ &= 28 \end{aligned}$$

$w = 28$

8

Substitute "-5" for "c" in the (right-hand side of the) formula.

If using your calculator it is good practice to put negative numbers in brackets.

$$G = (-5)^2 - 4(-5)$$

$$\begin{aligned} G &= 25 - (-20) \\ &= 25 + 20 \\ &= 45 \end{aligned}$$

$G = 45$

Q9-10

Substitute the given values into the given formula.

$$s = 12 \times 4 + \frac{1}{2} \times 10 \times 4^2$$

[1]

$$\begin{aligned} s &= 48 + 5 \times 16 \\ &= 48 + 80 \\ &= 128 \end{aligned}$$

$s = 128$ [1]

10

"Simplify" means to collect like (similar) terms
Collect the p terms together

$$2p - 5p = -3p$$

Collect the q terms together

$$-q - 3q = -4q$$

Either part correct [1]

Add the two results above

$$-3p - 4q$$

$-3p - 4q$ [1]

Q11-12

11

Substitute the values in to the formula, use brackets around negative numbers.

$$y = (-3) \times (-2) + (-8)$$

[1]

$y = -2$ [1]

12

Substitute the values for m , x and c into the given equation.

$$y = (-2)(-7) + (-3)$$

[1]

Calculate the answer.

$$y = 14 - 3$$

$y = 11$ [1]

Q13-14

13

Substitute the given values into the formula.

$$s = 5.2 \times 7 + \frac{1}{2} \times 1.6 \times 7^2$$

[1]

Typing this carefully into your calculator, work out s .

$$s = 75.6$$

$s = 75.6$ [1]

14

Solve $5x = 15$ by dividing both sides by 5

$$\begin{aligned} 5x &= 15 \\ x &= 3 \end{aligned}$$

Substitute $x = 3$ into $12x$ (multiply 3 by 12)

$$\begin{aligned} x = 3, \quad 12x &= 12 \times 3 \\ &= 36 \end{aligned}$$

$12x = 36$ [1]