GCSE Maths Substitution and Formulae (Higher): check-up and exam-style questions: answers

GCSE Maths - Substitution and Formulae - Higher - Test yourself

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at **websink.site/gcse/maths/ch08-substitution-formulae/higher/check-up-and-exam-style-questions/**

Exercise 8Z Check-up (non-calculator) Non-calculator

1 Work out the value of $5x + 2$ when $x = -3$.

Answer: −13

2 Use $v = u + at$ to work out v when $u = 4$, $a = 3$ and $t = 5$.

Answer: 19 m/s

3 Books cost £6 each and postage is £2. Write a formula for the total cost £C of n books.

Answer: $C = 6n + 2$

4 Make x the subject of $y = 4x - 1$.

Answer: $x = \frac{y + 1}{4}$

5 Make w the subject of $P = 2l + 2w$.

Answer: $w = \frac{P - 2l}{2}$

6 Work out the value of $x^2 - 3x$ when $x = -2$.

Answer: 10

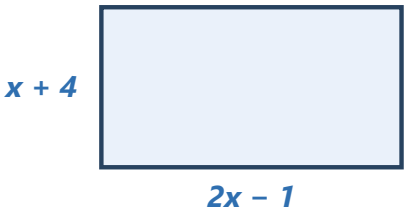
7 Use $E = \frac{1}{2}mv^2$ to work out E when $m = 6$ and $v = 4$.

Answer: 48 J

8 Make t the subject of $v = u + at$.

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

9 A rectangle has length $(2x - 1)$ cm and width $(x + 4)$ cm. Write a simplified expression for its perimeter.



Answer: 6x + 6

10 Make r the subject of $A = \pi r^2$.

Answer: $r = \sqrt{\frac{A}{\pi}}$

Exercise 8X Exam-style questions Non-calculator

1 Work out the value of $5a - 2b$ when $a = 4$ and $b = -3$. [2 marks]

Answer: 26

2 $v = u + at$. Work out the value of v when $u = 6$, $a = -2$ and $t = 4$. [3 marks]

Answer: −2 m/s

3 An electrician charges a £35 call-out fee plus £20 for each hour of work. [4 marks]

(a) Write a formula for the total charge £C for h hours.

Answer: $C = 35 + 20h$

(b) Work out the charge for 3.5 hours.

Answer: £105

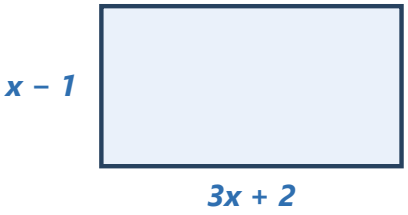
4 Make x the subject of $y = 5x - 7$. [2 marks]

Answer: $x = \frac{y + 7}{5}$

5 $A = \pi r^2$. Make r the subject of the formula. [2 marks]

Answer: $r = \sqrt{\frac{A}{\pi}}$

6 The diagram shows a rectangle with length $(3x + 2)$ cm and width $(x - 1)$ cm. Write a simplified expression for the perimeter of the rectangle. [3 marks]



Answer: 8x + 2

7 Amy runs 5 km in 25 minutes. Use $s = d/t$ to work out her average speed in km/h. [3 marks]

Answer: 12 km/h

8 Show that $3(x + 4) - 2(x + 1) = x + 10$. [2 marks]

Answer: x + 10

9 The kinetic energy E joules of an object of mass m kg moving at v m/s is $E = \frac{1}{2}mv^2$. [4 marks]

(a) Make m the subject of the formula.

Answer: $m = \frac{2E}{v^2}$

(b) Work out m when $E = 80$ and $v = 4$.

Answer: 10 kg

10 Work out the value of $2x^2 - x$ when $x = -4$. [2 marks]

Answer: 36

11 Maya says, "When $x = -2$, the value of $-x^2$ is 4." Is Maya correct? You must show your working. [2 marks]

Answer: No, it is −4

12 Firm A hires a ladder for £20 plus £5 per hour. Firm B hires the same ladder for £8 plus £8 per hour. Show that the two firms charge the same for 4 hours. [3 marks]

Answer: Both £40

13 Make x the subject of $y = \frac{x + 3}{x - 2}$. [4 marks]

Answer: $x = \frac{3 + 2y}{y - 1}$

14 The time T seconds for one swing of a pendulum of length l metres is $T = 2\pi\sqrt{(l/g)}$. [5 marks]

(a) Make l the subject of the formula.

Answer: $l = g(\frac{T}{2\pi})^2$

(b) Use $\pi = 3.14$ to work out l when $T = 6.28$ and $g = 9.8$.

Answer: 9.8 m

15 The volume of a sphere is $V = \frac{4\pi r^3}{3}$. Make r the subject of the formula. [3 marks]

Answer: $r = \sqrt[3]{\frac{3V}{4\pi}}$

16 Make k the subject of $b + ak = d + ck$. [4 marks]

Answer: $k = \frac{d - b}{a - c}$

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