GCSE Maths: Changing the subject: one step and two steps (Higher): answers

GCSE Maths - Substitution and Formulae - Higher - Lesson 8.6

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/changing-the-subject-one-step-and-two-steps/**

Exercise 8G Changing the subject: one and two steps (Non-calculator)

1 Make x the subject of each formula.

(a) Make x the subject of $y = x + 5$

Answer: $x = y - 5$

(b) Make x the subject of $y = x - 3$

Answer: $x = y + 3$

(c) Make x the subject of $y = 4x$

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

(d) Make x the subject of $y = \frac{x}{3}$

Answer: $x = 3y$

(e) Make x the subject of $y = x + a$

Answer: $x = y - a$

(f) Make x the subject of $y = kx$

Answer: $x = \frac{y}{k}$

2 Make x the subject of each formula.

(a) Make x the subject of $y = 2x + 3$

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

(b) Make x the subject of $y = 5x - 4$

Answer: $x = \frac{y + 4}{5}$

(c) Make x the subject of $y = \frac{x}{2} + 1$

Answer: $x = 2(y - 1)$

(d) Make x the subject of $y = \frac{x}{4} - 2$

Answer: $x = 4(y + 2)$

(e) Make x the subject of $y = 7 + 3x$

Answer: $x = \frac{y - 7}{3}$

(f) Make x the subject of $y = 2x - 9$

Answer: $x = \frac{y + 9}{2}$

3 **Rearrange each formula to make the letter in brackets the subject.**

(a) Make a the subject of $F = ma$

Answer: $a = \frac{F}{m}$

(b) Make m the subject of $F = ma$

Answer: $m = \frac{F}{a}$

(c) Make I the subject of $V = IR$

Answer: $I = \frac{V}{R}$

(d) Make R the subject of $V = IR$

Answer: $R = \frac{V}{I}$

(e) Make d the subject of $s = \frac{d}{t}$

Answer: $d = ts$

(f) Make t the subject of $s = \frac{d}{t}$

Answer: $t = \frac{d}{s}$

4 **Make the letter shown the subject.**

(a) Make u the subject of $v = u + at$

Answer: $u = v - at$

(b) Make a the subject of $v = u + at$

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

(c) Make d the subject of $C = \pi d$

Answer: $d = \frac{C}{\pi}$

(d) Make h the subject of $A = \frac{1}{2}bh$

Answer: $h = \frac{2A}{b}$

(e) Make w the subject of $P = 2l + 2w$

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

(f) Make s the subject of $P = 4s$

Answer: $s = \frac{P}{4}$

5 **Make x the subject of each formula.**

(a) Make x the subject of $y = mx + c$

Answer: $x = \frac{y - c}{m}$

(b) Make m the subject of $y = mx + c$

Answer: $m = \frac{y - c}{x}$

(c) Make c the subject of $y = mx + c$

Answer: $c = y - mx$

6 **Callum is asked to make x the subject of $y = 3x + 2$. He writes $x = y - \frac{2}{3}$. Use $x = 5$ to show that he is wrong, and give the correct answer.**

Answer: x = (y − 2)/3

7 **The cost, £C, of hiring a van for d days is $C = 35d + 20$.**

(a) Make d the subject of the formula.

Answer: $d = \frac{C - 20}{35}$

(b) Use your formula to find how many days the van was hired for when the cost was £195.

Answer: 5 days

8 **The area of a triangle is $A = ½bh$.**

(a) Make h the subject of the formula.

Answer: $h = \frac{2A}{b}$

(b) A triangle has area 30 cm^2 and base 12 cm. Work out its height.

Answer: 5 cm

9 **A car has mass m kg and a force of F newtons acts on it. The acceleration a m/s^2 is given by $F = ma$.**

(a) Make a the subject of the formula.

Answer: $a = \frac{F}{m}$

(b) Work out a when $F = 3000$ and $m = 1200$.

Answer: 2.5 m/s^2

10 **A train travels a distance d km at an average speed s km/h. It takes t hours, where $s = d/t$.**

(a) Make t the subject.

Answer: $t = \frac{d}{s}$

(b) How long does a journey of 360 km take at an average speed of 90 km/h?

Answer: 4 hours

11 The simple interest, I, earned on a sum of money P at R% a year for T years is $I = \frac{PRT}{100}$. Make P the subject.

Answer: $P = \frac{100I}{RT}$

12 Make y the subject of each formula.

(a) Make y the subject of $x = 2y + 1$

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

(b) Make y the subject of $x = \frac{y}{5} - 3$

Answer: $y = 5(x + 3)$

(c) Make y the subject of $a = 3y - b$

Answer: $y = \frac{a + b}{3}$

(d) Make y the subject of $p = q + 4y$

Answer: $y = \frac{p - q}{4}$

13 The cooking time T minutes for a turkey of mass m kg is $T = 40m + 20$. Jess cooks a turkey for 180 minutes. Make m the subject and work out the mass of her turkey.

(a) Make m the subject.

Answer: $m = \frac{T - 20}{40}$

(b) Work out m when $T = 180$.

Answer: 4 kg

14 (a) Rearrange $y = 12 - 2x$ to make x the subject. (b) Show that when $x = 4$ your formula gives back the right value.

(a) Make x the subject of $y = 12 - 2x$

Answer: $x = \frac{12 - y}{2}$

(b) Check with $x = 4$

Answer: x = 4

15 Starting from $s = d/t$, show that $d = st$.

Answer: d = st

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