

MATHSPPOINTS.IE
JUNIOR & LEAVING CERT

LINEAR EQUATIONS SOLUTIONS

JUNIOR CERT HIGHER LEVEL
OLD COURSE

Algebra: Linear Equations – Table of Contents



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2004 Paper 1 – Q3 (a)

2003 Paper 1 – Q2 (a)

Solve for x :

$$3x - [5 - (x - 3)] = 6$$

$$3x - [5 - (x - 3)] = 6$$

$$3x - (5 - x + 3) = 6$$

$$3x - 5 + x - 3 = 6$$

$$3x + x = 6 + 3 + 5$$

$$4x = 14$$

$$x = \frac{14}{4}$$

$$x = 3.5$$

$$\text{Solve } 3(x - 2) - 5(x - 3) = 1.$$

$$3(x - 2) - 5(x - 3) = 1$$

$$3x - 6 - 5x + 15 = 1$$

$$3x - 5x = 1 - 15 + 6$$

$$-2x = -8$$

$$x = 4$$

When 23 is added to 4 times a certain number, the answer is 11.
Find this number.

Let x be the certain number.

$$23 + 4x = 11$$

$$4x = 11 - 23$$

$$4x = -12$$

$$x = -3$$

$$\text{Solve } 3(x - 4) - 2(5x - 3) = 8$$

$$3(x - 4) - 2(5x - 3) = 8$$

$$3x - 12 - 10x + 6 = 8$$

$$3x - 10x = 8 - 6 + 12$$

$$-7x = 14$$

$$x = \frac{14}{-7}$$

$$x = -2$$

Solve $3(x - 2) + 1 = 19$ and verify your answer.

$$3(x - 2) + 1 = 19$$

$$3x - 6 + 1 = 19$$

$$3x = 19 + 6 - 1$$

$$3x = 24$$

$$x = 8$$

Verify $x = 8$

$$3(x - 2) + 1 = 19$$

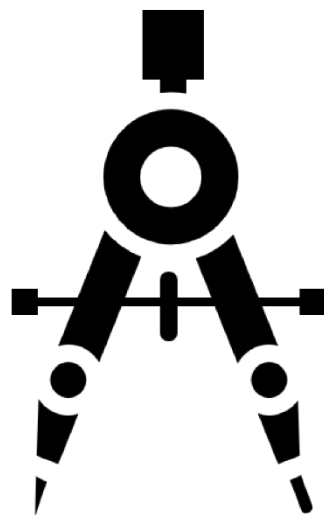
$$3(8 - 2) + 1 = 19$$

$$3(6) + 1 = 19$$

$$18 + 1 = 19$$

$$19 = 19$$

This is true.



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Solve for x :

$$11x - 5(2x - 1) = 3(6 - x) + 3.$$

$$11x - 5(2x - 1) = 3(6 - x) + 3$$

$$11x - 10x + 5 = 18 - 3x + 3$$

$$11x + 3x - 10x = 18 + 3 - 5$$

$$4x = 16$$

$$x = 4$$

Solve for $3(x - 7) + 5(x - 4) = 15$, where $x \in \mathbb{R}$.

$$3(x - 7) + 5(x - 4) = 15$$

$$3x - 21 + 5x - 20 = 15$$

$$3x + 5x = 15 + 21 + 20$$

$$8x = 56$$

$$x = \frac{56}{8}$$

$$x = 7$$

Solve for x :

$$2(4 - 3x) + 12 = 7x - 5(2x - 7)$$

$$2(4 - 3x) + 12 = 7x - 5(2x - 7)$$

$$8 - 6x + 12 = 7x - 10x + 35$$

$$8 - 35 + 12 = 7x - 10x + 6x$$

$$-15 = 3x$$

$$\frac{-15}{3} = x$$

$$-5 = x$$

(ii)

Verify your answer to (i) above.

Verify $x = -5$

$$2(4 - 3x) + 12 = 7x - 5(2x - 7)$$

$$2(4 - 3(-5)) + 12 = 7(-5) - 5(2(-5) - 7)$$

$$2(4 + 15) + 12 = 7(-5) - 5(2(-5) - 7)$$

$$50 = 50$$

Solve the equation $\frac{1}{2}(7x - 2) + 5 = 2x + 7$.

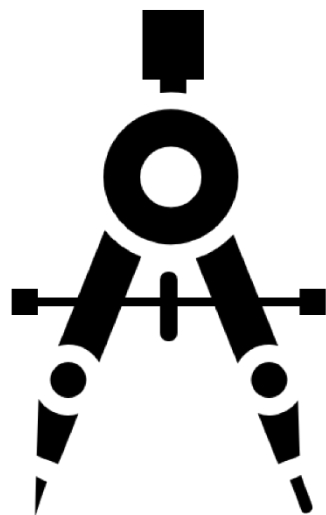
$$\frac{1}{2}(7x - 2) + 5 = 2x + 7$$

$$7x - 2 + 10 = 4x + 14$$

$$7x - 4x = 14 - 10 + 2$$

$$3x = 6$$

$$x = 2$$



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Given that $(t - 1)x = 2 - 5t$, find the value of x when $t = 7$.

$$(t - 1)x = 2 - 5t$$

$$(7 - 1)x = 2 - 5(7)$$

$$6x = 2 - 35$$

$$6x = -33$$

$$x = \frac{-33}{6}$$

$$x = -\frac{11}{2}$$

Given that $3a(x + 5) = 114$, find the value of x when $a = 4$.

$$3a(x + 5) = 114$$

$$3(4)(x + 5) = 114$$

$$12(x + 5) = 114$$

$$12x + 60 = 114$$

$$12x = 114 - 60$$

$$12x = 54$$

$$x = \frac{54}{12}$$

$$x = \frac{9}{2}$$

Given that $3(b + a) = t(6 - a)$,

Calculate the value of a when $t = 3$ and $b = -4$.

$$3(b + a) = t(6 - a)$$

$$3(-4 + a) = 3(6 - a)$$

$$-12 + 3a = 18 - 3a$$

$$3a + 3a = 18 + 12$$

$$6a = 30$$

$$a = \frac{30}{6}$$

$$a = 5$$

Solve $2x = 3(5 - x)$.

$$2x = 3(5 - x)$$

$$2x = 15 - 3x$$

$$2x + 3x = 15$$

$$5x = 15$$

$$x = \frac{15}{5}$$

$$x = 3$$

Given that $3x - 2y = 4$, find the value of y when $x = -2$.

$$3x - 2y = 4$$

$$3(-2) - 2y = 4$$

$$-6 - 2y = 4$$

$$-6 - 4 = 2y$$

$$-10 = 2y$$

$$\frac{-10}{2} = y$$

$$-5 = y$$