

ALGEBRA

Chapter 3: Algebra

Part 11: Solving Linear Equations



[Starter](#) (with the unknown on both sides)

[Video](#)

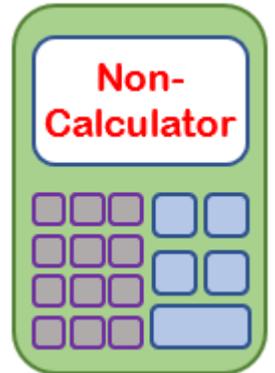
[Worksheet – I’m giving it a try!](#)

[Worksheet – I’m building my confidence!](#)

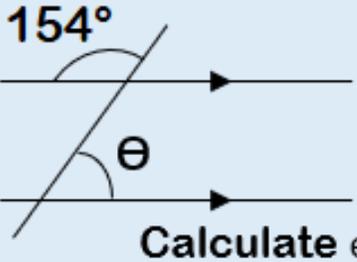
[Worksheet – I’m ready for anything!](#)

[Extension](#)

[Homework](#)



Answer 4 questions to make a straight line vertically, horizontally or diagonally.

Write 42 as a product of prime factors	If $a = 1$, $b = 2$ and $c = -5$, calculate $4a + bc$	A table that used to cost £180 has decreased in price by 61%. How much does it cost now?	The ratio of red to blue sweets is 1 : 3 and blue to green sweets is 1 : 5. What is the ratio of red to green sweets?
 <p>Calculate θ</p>	Factorise $4a^2 - 10ab$	Find the nth term of the sequence 6, 10, 14, 18, 22	Calculate $\frac{2}{4} \times \frac{1}{7}$
Calculate $\frac{1}{8} + \frac{3}{5}$	Estimate 14.96×3.76	Share 36 in the ratio 9 : 3	Expand and simplify $(x - 9)(x + 4)$
Solve $7(7y + 1) = -91$	The mean of these 4 numbers is 7.5. Calculate the missing value. 3, 3, 13, ?	Does the co-ordinate (2, 8) lie on the graph $y = 3x - 1$?	Calculate the size of one interior angle in a regular heptagon.

[Answers](#)

Answers

$2 \times 3 \times 7$	-6	£70.20	1 : 15
26°	$2a(2a-5b)$	$4n + 2$	$1/14$
$29/40$	40	$27 : 9$	$x^2 - 5x - 36$
$y = -2$	11	$8 = 3(2) - 1$ No	128.6°

Solving Linear Equations

(with the unknown on both sides)

Solve the following equations:

(a) $5x + 8 = 4x + 11$

(b) $6x + 2 = 3x + 14$

(c) $x + 4 = 3x + 1$

(d) $7x - 2 = 2x + 8$

(e) $5x - 2 = 9x - 2$

(f) $4x + 6 = -3x + 20$

(g) $10 - x = 2x - 5$

(h) $4(2x - 7) = 3(x - 6)$

Watch this [video](#) to see how to do the examples.
Remember to pause the video when promoted to copy the notes.

I'm giving it a try!

Solve the following equations:

(1) $2x = x + 4$

(2) $3x = 2x + 4$

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

(4) $3x + 2 = 2x + 6$

(5) $4x + 2 = 3x + 6$

(6) $3x + 6 = 4x + 2$

(7) $6x + 4 = 5x + 9$

(8) $9a + 8 = 10a + 5$

(9) $3x = x + 4$

(10) $4x = 2x + 4$

(11) $4x + 1 = 2x + 5$

(12) $4x + 2 = 2x + 6$

(13) $5x + 2 = 3x + 6$

(14) $3x + 6 = 5x + 2$

(15) $8x + 3 = 6x + 11$

(16) $5w + 18 = 7w + 4$

(17) $5x + 1 = 2x + 7$

(18) $4x + 5 = 7x + 2$

(19) $5x + 3 = x + 11$

(20) $3x + 38 = 8x + 8$

(21) $6x + 3 = 3x + 3$

(22) $12t + 1 = 8t + 3$

(23) $9x + 5 = 6x + 2$

(24) $9x + 4 = 11x + 10$

Answers

I'm giving it a try!

(1) $x = 4$

(2) $x = 4$

(3) $x = 4$

(4) $x = 4$

(5) $x = 4$

(6) $x = 4$

(7) $x = 5$

(8) $a = 3$

(9) $x = 2$

(10) $x = 2$

(11) $x = 2$

(12) $x = 2$

(13) $x = 2$

(14) $x = 2$

(15) $x = 4$

(16) $w = 7$

(17) $x = 2$

(18) $x = 1$

(19) $x = 2$

(20) $x = 6$

(21) $x = 0$

(22) $t = 0.5$ or $\frac{1}{2}$

(23) $x = -1$

(24) $x = -3$

Now that you have marked your work, take time to reflect on how confident you are feeling...

My Reflections...



[Back to the start!](#)

I'm building my confidence!

Solve the following equations:

(1) $5x - 3 = 4x + 2$

(2) $8x - 1 = 6x + 5$

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

(4) $x + 1 = 3x - 1$

(5) $4x - 6 = 3x$

(6) $7x - 6 = 4x - 3$

(7) $9x - 10 = 5x - 2$

(8) $6x - 5 = 4x - 9$

(9) $2x - 1 = 3x - 4$

(10) $4x - 20 = 10x - 2$

(11) $4x + 1 = 2x - 9$

(12) $3x - 6 = 7x - 4$

(13) $2x + 2 = -x + 11$

(14) $2x + 2 = 11 - x$

(15) $-2x + 1 = 3x + 6$

(16) $5 - 3x = 7x + 20$

(17) $3x - 1 = -x + 7$

(18) $5 - x = 5x - 1$

(19) $-2x + 6 = x - 9$

(20) $3x - 2 = 1 - 3x$

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

(22) $7 - 7x = 12 - 2x$

(23) $-2x - 10 = 5x - 10$

(24) $-1 - 2x = 5 - 10x$

Answers

I'm building my confidence!

$(1) x = 5$

$(2) x = 3$

$(3) x = 4$

$(4) x = 1$

$(5) x = 6$

$(6) x = 1$

$(7) x = 2$

$(8) x = -2$

$(9) x = 3$

$(10) x = -3$

$(11) x = -5$

$(12) x = -0.5 \text{ or } -\frac{1}{2}$

$(13) x = 3$

$(14) x = 3$

$(15) x = -1$

$(16) x = -1.5 \text{ or } -1\frac{1}{2}$

$(17) x = 2$

$(18) x = 1$

$(19) x = 5$

$(20) x = 0.5 \text{ or } \frac{1}{2}$

$(21) x = 2$

$(22) x = -1$

$(23) x = 0$

$(24) x = 0.75 \text{ or } \frac{3}{4}$

Now that you have marked your work, take time to reflect on how confident you are feeling...

My Reflections...



[Back to the start!](#)

I'm ready for anything!

Solve the following equations:

(1) $4x = 3(x + 1)$

(2) $3(x + 4) = 2(x + 9)$

(3) $5(x + 2) = 3(x + 4)$

(4) $2(x + 5) = 6(x - 1)$

(5) $4(x - 5) = 7(x - 2)$

(6) $8(2x - 5) = 3(5x - 10)$

(7) $5(2x + 5) = 3(6x + 7)$

(8) $9(2x - 5) = 3(4x + 7)$

(9) $2(2x + 4) = 4(2 - x)$

(10) $10(3x - 4) = 20(5 - 2x)$

(11) $6(3 - 4x) + 14 = 8(3x + 1)$

(12) $5(2 - 7x) + 25x = 2(6 - 4x)$

Answers

I'm ready for anything!

(1) $x = 3$

(2) $x = 6$

(3) $x = 1$

(4) $x = 4$

(5) $x = -2$

(6) $x = 10$

(7) $x = 0.5$ or $\frac{1}{2}$

(8) $x = 11$

(9) $x = 0$

(10) $x = 2$

(11) $x = 0.5$ or $\frac{1}{2}$

(12) $x = -1$

Now that you have marked your work, take time to reflect on how confident you are feeling...

My Reflections...

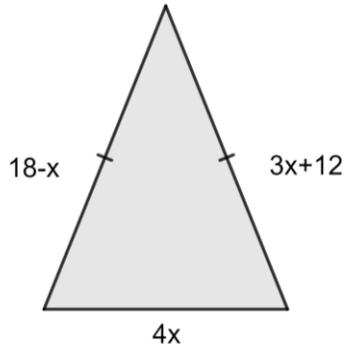


[Back to the start!](#)

Extension

By using your knowledge about isosceles triangles, find:

- (a) the value for x
- (b) the perimeter of the triangle



By finding the value for x first, find the value for y :

$$6x - 3 = 2x + 29$$

$$5x + 17 = 4x + 2y - 3$$

Explain why the following equation has no solutions:

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

Answers

By using your knowledge about isosceles triangles, find:

- (a) the value for x
(b) the perimeter of the triangle



$$(a) \begin{aligned} 18 - x &= 3x + 12 \\ x &= 1.5 \end{aligned}$$

$$(b) \begin{aligned} 18 - x + 3x + 12 + 4x \\ &= 30 + 6x \\ &= 30 + 6(1.5) = 39 \end{aligned}$$

By finding the value for x first, find the value for y :

$$6x - 3 = 2x + 29$$

$$5x + 17 = 4x + 2y - 3$$

$$4x - 3 = 29$$

$$4x = 32$$

$$x = 8$$

$$5(8) + 17 = 4(8) + 2y - 3$$

$$57 = 29 + 2y$$

$$2y = 28$$

$$y = 14$$

Explain why the following equation has no solutions:

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

$$12x + 8 = 12x + 5$$

now subtract $12x$

$$8 = 5$$

this does not make sense

Homework

Retrieval Homework	Topic Homework
1) Calculate $\frac{3}{8} + \frac{3}{7}$	<i>Solve the following equations:</i> (a) $6x + 3 = 5x + 5$
2) Share 162 in the ratio 3 : 6	(b) $7x + 1 = 4x + 10$
3) Expand $(x - 8)(x + 4)$	(c) $2x + 3 = 4x + 5$
4) Increase £180 by 83%	(d) $9x - 11 = 4x + 9$
5) Solve $9(4y + 1) = 81$	(e) $2x + 4 = 8x + 4$
	(f) $-x + 2 = 5x - 1$
	(g) $2x - 4 = 8 - 2x$
	(h) $2(x - 3) = 3(5x + 11)$

My Reflections...



[Answers](#)

Answers

Homework

Retrieval Homework

(1) $\frac{45}{56}$ (2) 54:108 (3) $x^2 - 4x - 32$ (4) £329.40 (5) $y=2$

Topic Homework

(a) $x = 2$

(b) $x = 3$

(c) $x = -1$

(d) $x = 4$

(e) $x = 0$

(f) $x = 0.5$ or $\frac{1}{2}$

(g) $x = 3$

(h) $x = -3$