Solving Linear Equations

09 January 2020 12:07

An equation is an expression with an equals sign (=)

For all equations to be balanced the LHS must equal the RHS. Example $2x = 8$ what is x?

$2(4) = 8$ $\therefore x = 4$

A linear equation is a straight line when graphed.

We can use external stabilizers to get the equation to balance

N.B- you must do the same operation on both sides of the equation. Operations will be addition, subtraction multiplication, division.

Remember the Rule: In Algebra you can only ADD or subtract like terms.

Eg 1) $7x - 3 = 18$ ← Stabilizer

$+3$	$7x = 21$	$+3$
$\div 7$	$x = 3$	$\div 7$
	$x = ?$	

Solve to find a value for x

Eg 2) $3(x-1) = 18 - 5(x+1)$ Get rid of brackets.

$3x - 3 = 18 - 5x - 5$ Tidy up

$3x - 3 = 13 - 5x$

$+5x$	$8x - 3 = 13$	$+5x$
$+3$	$8x = 16$	$+3$
$\div 8$	$x = 2$	$\div 8$

$+3$ | $8x = 16$ | -3

$\div 8$ | $x = 2$ | $\div 8$

Verify your answer $\Rightarrow$ sub into equation

$3(2) - 3 = 13 - 5(2)$

$6 - 3 = 13 - 10$

$3 = 3$ ✓

Classwork Pg 7 Q4

T&T3 1.4

T&T3 1.4.pptx

Section 1.4 Solving linear equations

Notes

$3x - 5 = 7$ is an example of an **equation** as it contains an = sign.

Solving an equation involves finding the value of the variable that makes the equation true.

The following two examples will illustrate the steps involved in solving a linear equation.

Example 1

Solve the equation $5x - 3 = 2x + 9$.

6

Example 2

Solve the equation $5(2x - 4) = 3(2x - 1) - 1$.

7

Exercise 1.4

Answers:
1. $x = 4$ **2.** $x = 5$ **3.** $x = 5$
4. $x = 8$ **5.** $x = 6\frac{1}{2}$ **6.** $x = 3$

Solve each of the following equations:

1. $2x = 8$ **2.** $3x = 15$ **3.** $8x = 40$

Pg 7

4. $x - 3 = 5$

$8 - 3 = 5$

5. $2x - 3 = 10$

$2(6.5) - 3 = 10$

$13 - 3 = 10$

6. $3x - 1 = 8$

$3(3) - 1 = 8$

$9 - 1 = 8$

Exercise 1.4

Answers:
7. $x = 2$ **8.** $x = 6$ **9.** $x = 5$
10. $x = 3$ **11.** $x = 6$ **12.** $x = 5$

Solve each of the following equations:

7. $5x + 2 = 12$

$5(2) + 2 = 12$

$10 + 2 = 12$

8. $3x - 10 = 8$

$+10 \mid 3x = 18 \mid +10$

$\div 3 \mid x = 6 \mid \div x$

9. $5x - 6 = 19$

$+6 \mid 5x = 25 \mid +6$

$\div 5 \mid x = 5 \mid \div 5$

10. $7x + 4 = 25$

$-4 \mid 7x = 21 \mid -4$

$\div 7 \mid x = 3 \mid \div 7$

11. $6x - 2 = 4x + 10$

$-4x \mid 2x - 2 = 10 \mid -4x$

$+2 \mid 2x = 12 \mid +2$

$\div 2 \mid x = 6 \mid \div 2$

12. $7x - 9 = 3x + 11$

$-3x \mid 4x - 9 = 11 \mid -3x$

$+9 \mid 4x = 20 \mid +9$

$\div 4 \mid x = 5 \mid \div 4$

HW Pg 7 Q13, 16, 19

Exercise 1.4

Answers: **13.** $x = 7$ **14.** $x = 7$ **15.** $x = 5$

Solve each of the following equations:

13. $3x + 1 = 5x - 13$ **14.** $5x - 2 = 40 - x$ **15.** $3x + 7 = 32 - 2x$

Exercise 1.4

Answers: **16.** $x = 2$ **17.** $x = 5$

Solve each of the following equations:

16. $3(2x + 1) = 2x + 11$ **17.** $2(2x + 5) = 5x + 5$

Exercise 1.4

Answers: **18.** $x = 1$ **19.** $x = 10$

Solve each of the following equations:

18. $4(2x - 3) = 2(3x - 5)$

19. $3(2x - 6) = 2(2x + 1)$

Exercise 1.4

Answers: **20.** $x = 10$ **21.** $x = 5$

Solve each of the following equations:

20. $3(5x - 2) = 4(3x + 6)$

21. $6(1 + 2x) = 5(3x - 1) - 4$

Exercise 1.4

Answers: **22.** $x = 3$ **23.** $x = 3$

Solve each of the following equations:

22. $2(x + 2) - 3(x - 3) = x + 7$

23. $3(4 - 3x) = 5(3 - 2x)$

Exercise 1.4

Answers: **24.** $x = 9$ **25.** $x = 2$

Solve each of the following equations:

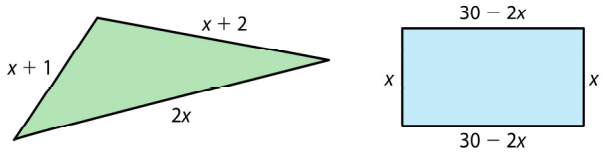
24. $4(x + 3) - 3(2x - 5) = x$

25. $3(x - 1) = 18 - 5(x + 1)$

Exercise 1.4

Answers: (i) 15 (ii) $60 - 2x$ (iii) $9\frac{1}{2}$ (iv) 10

26. The figures below show a triangle and a rectangle.



(i) What value of x gives a triangle with a perimeter of 63 units?
(ii) Find and simplify an expression for the perimeter of the rectangle.
(iii) For what value of x are the perimeters of the triangle and rectangle equal?
(iv) What value of x makes the rectangle into a square?

Exercise 1.4

Answers: $x = 35°$; 101°, 64°, 15°

27. Form an equation and solve it to find the value of x in the given triangle.
Hence write down the measure of each angle.