Hello to all our users!

In response to the challenges presented by the ongoing Coronavirus situation, the Beyond team have made it their top priority to ensure that you and your children are catered to for your home-based educational needs. As such, we have decided to introduce **Interactive Resources** that can be completed using free-to-download PDF reading software, on a home PC/Laptop or Android/IOS smart device, sparing you the need to print where possible. By following the guidance below, we hope to offer you a smooth, stress-free means of continuing your children's education from the comfort of your home.

Step 1: Download for PC/Mac (or search 'Adobe Acrobat Reader' on Google Play or the App Store).

Follow the link above to open the download page for the PC/Mac version of Adobe Acrobat Reader. Click 'Download Acrobat Reader' at the bottom of the middle column - this will take you to a download page where your download will begin. Open the downloaded file and Acrobat Reader will install automatically (check the 'Launch Adobe Acrobat Reader DC' checkbox before clicking 'Finish' if you would like to open the program straight away).

Step 2: Download one of our interactive resources, and open using Adobe Acrobat Reader DC.

If you are a PC/Mac user and your downloaded PDF resource does not open using Acrobat Reader by default, simply right-click your PDF file, go to 'Open with' and select Adobe Acrobat Reader DC from the drop-down list.

For smart device users, open the Adobe Acrobat Reader app, press 'Files' at the bottom of the homescreen, then press 'On this device' and select the PDF you wish to open.

Step 3: Complete the resource!

For PC/Mac users: To fill in the resource, click the text fields and type your answers as needed. Check boxes and radio buttons can simply be clicked on to make the selection of your choice. When you are finished with the resource, go to File > Save As... and save your file where you like (we recommend you do not save over the original PDF, as you may wish to use it again without first having to remove all the answers!)

For smart device users: To fill in the resource, press the text fields and type your answers as needed. Check boxes and radio buttons can simply be clicked on to make the selection of your choice. When you are finished, simply press the back button in the top left of the appscreen and your PDF will save automatically (this will overwrite the original file, so you may wish to create a copy if you would like to use the resource again in future without first having to remove all the answers!)

Step 4: Rinse and repeat!

We hope you have found this information useful. If you experience any problems in getting the above method to work, please do contact the Beyond team at _____ and we will endeavour to do what we can to assist you.

Your turn

Solve each of the following equations:

1. $12x + 2 = 2x - 28$

   $10x = -30$

   $x = -3$

2. $4x - 2 = 12 - 3x$

   $7x = 14$

   $x = 2$

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

   $3x = -15$

   $x = -5$

4. $15x - 45 = 9x - 9$

   $6x = 36$

   $x = 6$

5. $11x + 4 = 3x - 12$

   $8x = -16$

   $x = -2$

6. $10x + 19 = 4x + 34$

   $6x = 15$

   $x = 2.5$

7. $5x + 2 = 16 - 2x$

   $7x = 14$

   $x = 2$

8. $3x + 3 = x + 8$

   $2x = 5$

   $x = 2.5$

9. $8x + 40 = 3x + 5$

   $5x = -35$

   $x = -7$

10. $9x + 12 = 6x + 14$

    $3x = 2$

    $x = \frac{2}{3}$

11. $5(x + 3) = 3(x + 9)$

    $5x + 15 = 3x + 27$

    $2x = 12$

    $x = 6$

12. $8(x - 1) = 4(x + 3)$

    $8x - 8 = 4x + 12$

    $4x = 20$

    $x = 5$

13. $\frac{6x + 1}{2} = 2x + 3$

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

    $6x + 1 = 4x + 6$

    $2x = 5$

    $x = 2.5$

14. $\frac{5x + 2}{3} = x + 2$

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

$5x + 2 = 3x + 6$

$2x = 4$

$x = 2$

16. $3 + 2x = \frac{1}{2}(7x - 18)$

$3 + 2x = 3.5x - 9$

$12 = 1.5x$

$8 = x$

15. $3x - 2 = \frac{10x + 1}{4}$

$4(3x - 2) = 10x + 1$

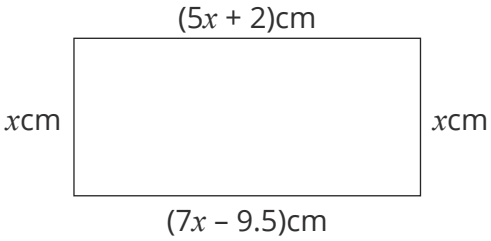
$12x - 8 = 10x + 1$

$2x = 9$

$x = 4.5$

Challenge

The diagram shows a rectangle.



a. Explain why $5x + 2 = 7x - 9.5$

The opposite sides of a rectangle have the same length.

b. Solve $5x + 2 = 7x - 9.5$

$2x = 11.5$

$x = 5.75$

c. Use your answer to part (b) to work out the perimeter of the rectangle.

$5 \times 5.75 + 2 = 30.75$cm

$7 \times 5.75 - 9.5 = 30.75$cm

$30.75 + 30.75 + 5.75 + 5.75 = 73$cm

Solving Linear Equations with Variables on Both Sides

Prior Knowledge:

- Solving equations with the variable on one side
- Expanding brackets

Solving equations means to find the **value** of x (or whatever letter is used) that makes the equation true. To do this, you will have to **rearrange** the equation to get x (or whatever letter is used) on its **own**.

Rather than using trial and error or guessing the value of x, it is best to keep **rearranging** the equation until you get the 'x =' on one side. There are a few **important** things to remember when rearranging.

1) You must always do the same thing to both sides of the equation.
2) To 'get rid' of something, do the opposite (use its inverse).
   - The inverse of + is – and the inverse of – is +.
   - The inverse of × is ÷ and the inverse of ÷ is ×.
3) Finally, you must keep going until you have a letter **on its own**.

Equations can have **unknowns** or a **variable** on both sides of the equation.

Example 1

Solve the following equation: $8x + 2 = 3x + 12$

Collect all the terms containing x on one side and all the terms which don't on the other. It doesn't matter which order you start in, so long as you systematically move one term at a time. It's a good idea to write down what you're doing at every stage – put it in brackets next to the equation to help you see the calculations you are doing.

Let's start by moving the $3x$. To do this, you must subtract $3x$ from both sides of the equation.

$$\begin{array}{l} 8x + 2 = 3x + 12 \\ (-3x) \qquad\qquad\quad (-3x) \\ 5x + 2 = 12 \end{array}$$

Now, you are able to move the 2 to the other side by subtracting it from both sides of the equation.

$$\begin{array}{l} 5x + 2 = 12 \\ (-2) \qquad\quad (-2) \\ 5x = 10 \end{array}$$

Finally, divide by 5 to get the 'x =' on the one side:

$$\begin{array}{l} 5x = 10 \\ (\div 5) \qquad (\div 5) \\ x = 2 \end{array}$$

Example 2

Solve the following equation: $\frac{4x - 3}{5} = x - 2$

Start by multiplying both sides by 5.

$$\frac{4x - 3}{5} = x - 2$$
(× 5) (× 5)
$$4x - 3 = 5(x - 2)$$

Then, expand the bracket.

$4x - 3 = 5x - 10$

Now, you are able to solve your equation.

$$4x - 3 = 5x - 10$$
(– 4x) (– 4x)
$$-3 = x - 10$$
(+ 10) (+ 10)
$$7 = x \text{ (which is the same as } x = 7)$$

Your turn

Solve each of the following equations:

1. $12x + 2 = 2x - 28$

2. $4x - 2 = 12 - 3x$

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

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12. $8(x - 1) = 4(x + 3)$

13. $\frac{6x + 1}{2} = 2x + 3$

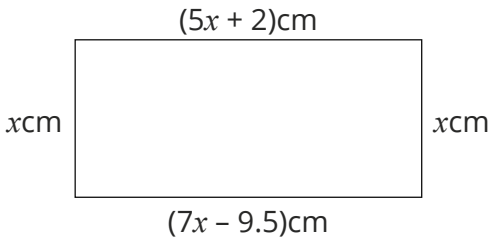
14. $\frac{5x + 2}{3} = x + 2$

15. $3x - 2 = \frac{10x + 1}{4}$

16. $3 + 2x = \frac{1}{2}(7x - 18)$

Challenge

The diagram shows a rectangle.



a. Explain why $5x + 2 = 7x - 9.5$

b. Solve $5x + 2 = 7x - 9.5$

c. Use your answer to part (b) to work out the perimeter of the rectangle.

Solving Linear Equations with Variables on Both Sides

Prior Knowledge:

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Solving equations means to find the **value** of x (or whatever letter is used) that makes the equation true. To do this, you will have to **rearrange** the equation to get x (or whatever letter is used) on its **own**.

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Now, you are able to move the 2 to the other side by subtracting it from both sides of the equation.

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Finally, divide by 5 to get the 'x =' on the one side:

$$\begin{array}{l} 5x = 10 \\ (\div 5) \qquad (\div 5) \\ x = 2 \end{array}$$

Example 2

Solve the following equation: $\frac{4x - 3}{5} = x - 2$

Start by multiplying both sides by 5.

$$\frac{4x - 3}{5} = x - 2$$
(× 5) (× 5)
$$4x - 3 = 5(x - 2)$$

Then, expand the bracket.

$4x - 3 = 5x - 10$

Now, you are able to solve your equation.

$$4x - 3 = 5x - 10$$
(– 4x) (– 4x)
$$-3 = x - 10$$
(+ 10) (+ 10)
$$7 = x \text{ (which is the same as } x = 7)$$

Your turn

Solve each of the following equations:

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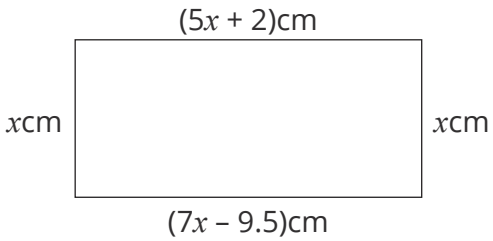

a. Explain why $5x + 2 = 7x - 9.5$

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c. Use your answer to part (b) to work out the perimeter of the rectangle.