

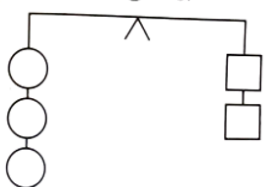
# Year 7 Solving Equations Worksheet

## Section 1 – Balancing

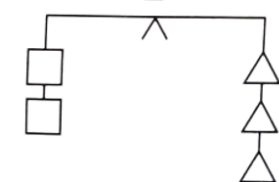
Write an equation to describe each diagram and then solve to find the missing values.

You may use any algebraic value for the unknown.

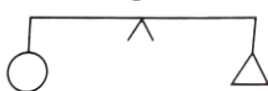
7. Find  $\square$  if  $\bigcirc = 8$ .



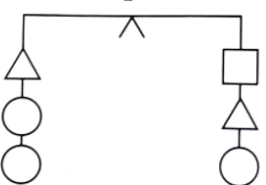
8. Find  $\triangle$  if  $\square = 15$ .



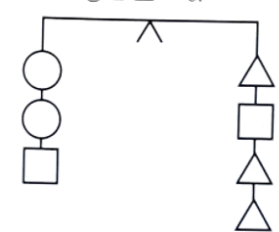
9. Find  $\triangle$  if  $\bigcirc = 14$ .



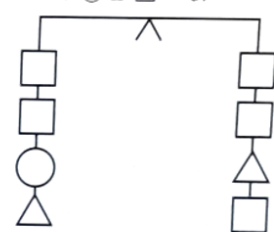
10. Find  $\square$  if  $\bigcirc = 8$ .



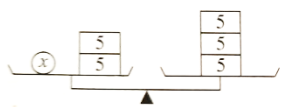
11. Find  $\bigcirc$  if  $\triangle = 6$ .



12. Find  $\bigcirc$  if  $\square = 5$ .



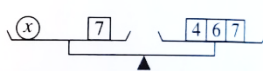
1.



2.



3.



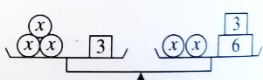
4.



5.



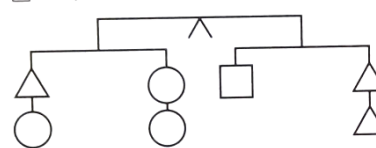
6.



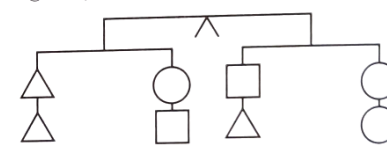
## Section 3 – Harder Balancing

Identify the missing values – you don't need to write equations for these problems.

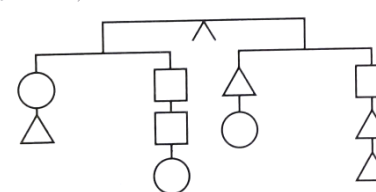
11.  $\square = 6$ , find  $\triangle$  and  $\bigcirc$ .



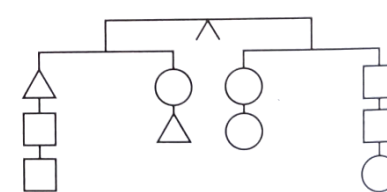
12.  $\bigcirc = 5$ , find  $\square$  and  $\triangle$ .



13.  $\triangle = 4$ , find  $\bigcirc$  and  $\square$ .



14.  $\bigcirc = 8$ , find  $\square$  and  $\triangle$ .



## Section 4 – Transforming Equations

1. In each part, transform the starting equation by doing the same thing to both sides using the instructions.

a.

$$x = 4$$

(+1) \_\_\_\_\_ (+1)  
 (+3) \_\_\_\_\_ (+3)  
 (+x) \_\_\_\_\_ (+x)  
 (+-3) \_\_\_\_\_ (+-3)

b.

$$10 = x + 3$$

(+1) \_\_\_\_\_ (+1)  
 (+3) \_\_\_\_\_ (+3)  
 (+x) \_\_\_\_\_ (+x)  
 (+-3) \_\_\_\_\_ (+-3)

c.

$$3x = 15$$

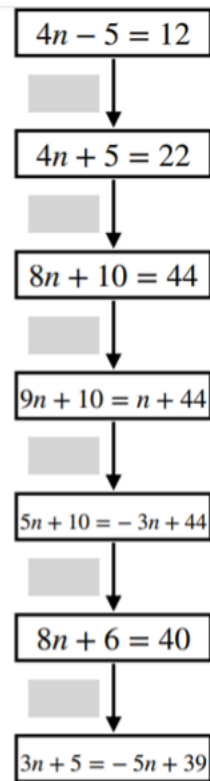
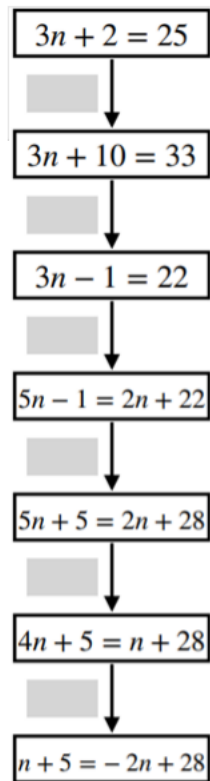
(+6) \_\_\_\_\_ (+6)  
 ( $\div 3$ ) \_\_\_\_\_ ( $\div 3$ )  
 (+-2) \_\_\_\_\_ (+-2)  
 ( $\times 2$ ) \_\_\_\_\_ ( $\times 2$ )

d.

$$6 + x = 2 - x$$

(+x) \_\_\_\_\_ (+x)  
 ( $\times 2$ ) \_\_\_\_\_ ( $\times 2$ )  
 (-12) \_\_\_\_\_ (-12)  
 ( $\div 4$ ) \_\_\_\_\_ ( $\div 4$ )

## Section 4 – Equation Waterfalls



## Section 5 – Expression or Equation

3. Circle the correct word to show whether the statement is an expression or an equation.

- |                 |                       |
|-----------------|-----------------------|
| a. $x + 5 = 19$ | EXPRESSION / EQUATION |
| b. $x + 5$      | EXPRESSION / EQUATION |
| c. $x - 5$      | EXPRESSION / EQUATION |
| d. $x - 203$    | EXPRESSION / EQUATION |
| e. $9 + x = 16$ | EXPRESSION / EQUATION |
| f. $9 + x = 6$  | EXPRESSION / EQUATION |
| g. $2x$         | EXPRESSION / EQUATION |

## Section 6 – Solving Equations

Solve the following equations. Ensure that you show the operations being performed to each expression at each stage.

- |                            |                            |
|----------------------------|----------------------------|
| a. $3x + 5 = 28$           | b. $3x - 5 = 28$           |
| c. $28 = 5x + 3$           | d. $28 = 5x - 3$           |
| d. $7x + -4 = 30$          | e. $\frac{x}{7} + 4 = 12$  |
| f. $-4 + \frac{x}{7} = 12$ | g. $12 = -7 + \frac{x}{4}$ |

## Section 7 - Simplify and Solve

- |                       |                       |
|-----------------------|-----------------------|
| a. $5y + 7 + 2y = 19$ | b. $5a - 7 + 2a = 19$ |
| c. $5t + 7 - 2t = 19$ | d. $19 = 5x - 7 - 2x$ |

## Section 8 – Multiples unknowns and Equations

The totals of rows and columns are shown on this diagram. Form and solve equation to find the sum of the missing values

Problem	Deductions																									
<table border="1"> <tr><td>s</td><td>v</td><td>t</td><td>u</td><td>?</td></tr> <tr><td>s</td><td>s</td><td>s</td><td>s</td><td>16</td></tr> <tr><td>t</td><td>v</td><td>t</td><td>u</td><td>12</td></tr> <tr><td>v</td><td>v</td><td>s</td><td>u</td><td></td></tr> <tr><td></td><td>13</td><td></td><td>19</td><td></td></tr> </table>	s	v	t	u	?	s	s	s	s	16	t	v	t	u	12	v	v	s	u			13		19		$4s = \underline{\quad}$ $s = \underline{\quad}$ $s + 3u = \underline{\quad}$ $3u = \underline{\quad}$ $u = \underline{\quad}$ $s + 3v = \underline{\quad}$ $3v = \underline{\quad}$ $v = \underline{\quad}$ $2t + v + u = \underline{\quad}$ $2t = \underline{\quad}$ $t = \underline{\quad}$ $s + v + t + u = \underline{\quad}$
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