Concept: Solving One-Step Equations

Name:

COMPUTER COMPONENT

Instructions: In UMATH X follow the **Content Menu** path:

Equations > **Solving One-Step Equations**

Work through all Sub Lessons of the following Lessons **in order**:

- *Our Problem*
- *Examples With Tiles*
- *Examples Without tiles*

Additional Required Materials: Pencil Crayons (red and blue)

As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

NOTES:

Remember:

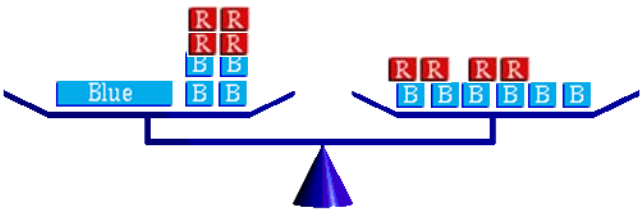
Tile	Represents
Blue Tile	**1**
Red Tile	**-1**
+	**1-1 or 0**

Solve the following examples:

1. $x + 4 = 6$

$x = 2$

Solution:
Place 4 red blocks on each side of the scale.
Since 1 R + 1 B = 0
∴ x = 2

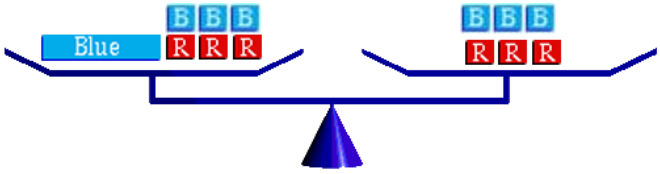


Draw the appropriate number of red tiles (-1) over the blue tiles (+1).

Remember to keep the balance balanced.

2. b - 3 = -3

b = ***0***



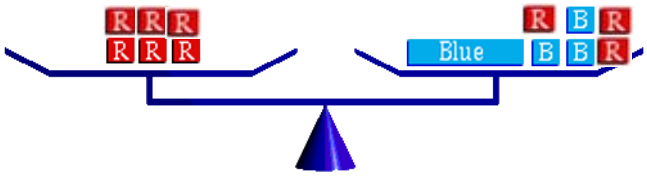
Solution:
Add 3 blue blocks on each side of the scale.
Since 1R + 1B = 0
∴ b = 0

Draw the appropriate number of blue tiles (+1) over the red tiles (-1).

Remember to keep the balance balanced.

3. -3 = m + 3

-6 = m



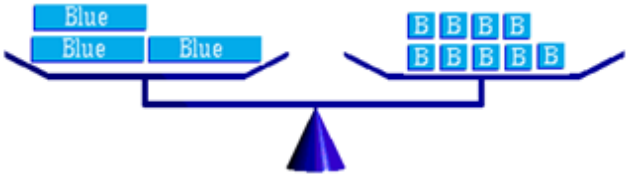
Solution:
Place 3 red blocks on each side of the scale.
Since 1R + 1B = 0
∴ m = -6

Draw the appropriate number of red tiles (-1) over the blue tiles (+1).

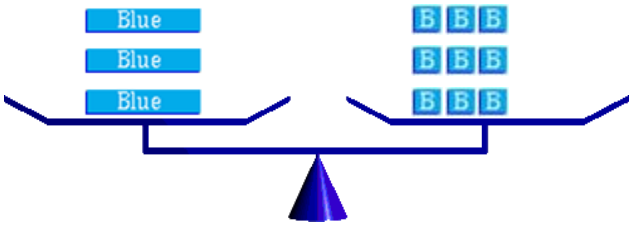
Remember to keep the balance balanced.

4. 3x = 9

x = **3**



In the diagram below, the blocks are arranged in three equal groups. Looking at one group, x = 3.

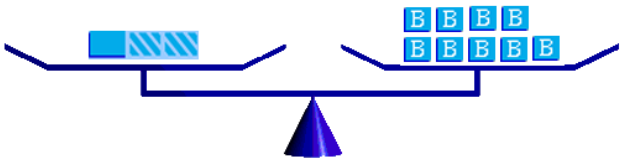


Isolate the x tile.
Rearrange each side into 3 equal groups

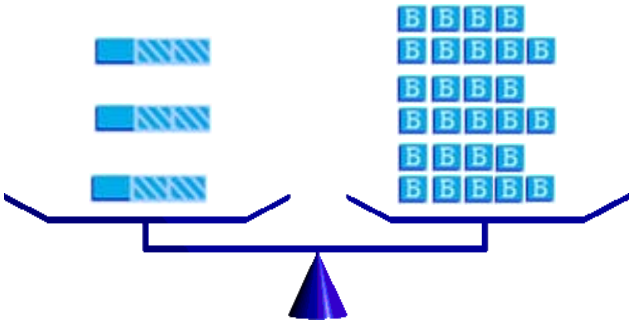
Remember to keep the balance balanced.

5. $\frac{1}{3}x = 9$

$x = \underline{27}$



In the diagram below, the blocks are tripled.
The left side is $\frac{1}{3}x + \frac{1}{3}x + \frac{1}{3}x = x$
The right side total is 27.



Isolate the x tile.
***Triple** the contents of each balance.*

Remember to keep the balance balanced.

Without Tiles

Fill in the blanks

Step 1: Rewrite the ***equation.***

Step 2: ***Isolate*** the ***x term.***

(*Hint: Think of balancing the balance*)

- Perform the ***same*** operation on ***both sides*** of the equation.
- Determine which operation; **(+), (-), (×),** or **(÷)** should be applied to ***both*** sides.

Step 3: ***Simplify***

Step 4: ***Check your answer in the original equation.***

Example:

Solve for x *(fill in the blanks)*

	x + 6 = 7		**Step 1**
-6)	**x + 6 - 6 = 7 - 6**		**Step 2**
	x = *1*		**Step 3**

Checking

Left Side	**=**	**x**	**+**	**6**
	=	**1**	**+**	**6**
	=	**7**		
Right Side	**=**	**7**		

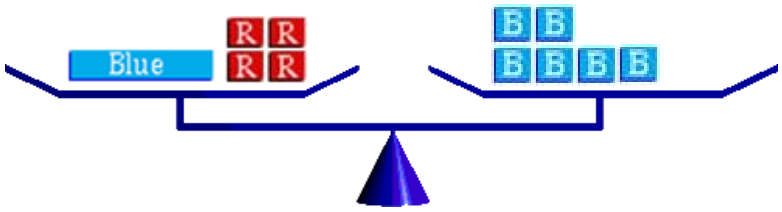
L.S. = R.S.
Therefore the solution x = 1 is correct

Step 4

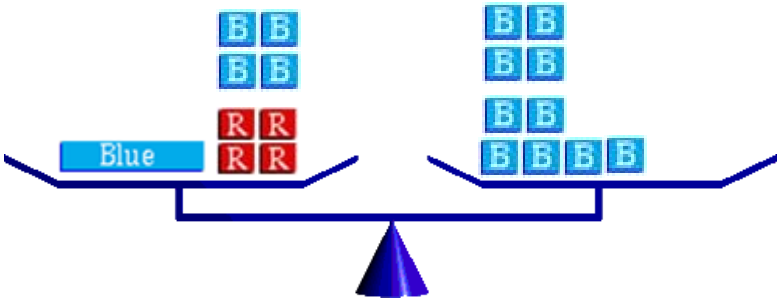
OFF COMPUTER EXERCISES

1. Given the equation $x - 4 = 6$.

   (a) Represent the equation on the balance by using tiles.



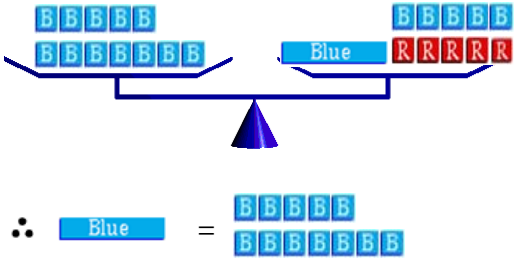
   (b) Isolate the x tile by manipulating the tiles. ***(Manipulate the tiles by adding an identical number of red or blue tile to each side)***



(c) Write the resulting equation and simplify it.

$$x - 4 + 4 = 6 + 4$$
$$x = 10$$

2. Solve each equation $7 = x - 5$ in two ways.

With the Balance	Without the Balance
	*7 = x – 5* *+5) 5 + 7 = x – 5 + 5* *12 = x* ***Checking:*** ***L.S. = 7 R.S. = x – 5*** *= (12) – 5* *= 7* ***Both sides simplify to the same number, the solution x = 12 is correct.***

(a) Which method did you prefer? Why?

(Answers will vary)

3. Solve each equation. *Be sure to write out all of your steps and to check each answer.*

(a) $x - 5 = 7$

+5) x -5 + 5 = 7 + 5

x = 12

Check:

L.S. = x - 5 R.S. = 7
= 12 - 5
= 7

L.S. = R.S , The solution is x = 12.

(b) $y + 3 = 8$

-3) y + 3 - 3 = 8 – 3

y = 5

Check:

L.S. = y + 3 R.S. = 8
= 5 + 3
= 8

L.S. = R.S, The solution is y = 5.

(c) $a + 7 = 3$

-7) $a + 7 - 7 = 3 - 7$

$a = -4$

Check:

L.S. $= a + 7$ ***R.S.*** $= 3$
$= -4 + 7$
$= 3$

L.S. = R.S, The solution is a = -4.

(d) $x + 6 = -4$

-6) $x + 6 - 6 = -4 - 6$

$x = -10$

Check:

L.S. $= x + 6$ ***R.S.*** $= -4$
$= -10 + 6$
$= -4$

L.S. = R.S , The solution is x = -10
.

(e) $5y = -25$

÷5) $\frac{5y}{5} = \frac{-25}{5}$

$y = -5$

Check

L.S. $= 5y$ ***R.S.*** $= -25$
$= 5(-5)$
$= -25$

L.S. = R.S , The solution is y = -5.

(f) $7b = 35$

÷7) $\frac{7b}{7} = \frac{35}{7}$

$b = 5$

Check

L.S. $= 7b$ ***R.S.*** $= 35$
$= 7(5)$
$= 35$

L.S. = R.S , The solution is b = 5.

(g) $4n = -12$

$\div 4)$ $\frac{4n}{4} = \frac{-12}{4}$

$n = -3$

Check

L.S. $= 4n$ *R.S.* $= -12$
$= 4(-3)$
$= -12$

L.S. = R.S, The solution is n = -3.

(h) $10x = 100$

$\div 10)$ $\frac{10x}{10} = \frac{100}{10}$

$x = 10$

Check

L.S. $= 10x$ *R.S.* $= 100$
$= 10(10)$
$= 100$

L.S. = R.S, The solution is x = 10.

(i) $0.9x = 9$

$\div 0.9)$ $\frac{0.9x}{0.9} = \frac{9}{0.9}$

$x = \frac{90}{9}$

$x = 10$

Check

L.S. $= 0.9x$ *R.S.* $= 9$
$= 0.9(10)$
$= 9$

L.S. = R.S, The solution is x = 10.

(j) $7p - 1 = 34$

$+1)$ $7p - 1 + 1 = 34 + 1$

$7p = 35$

$\div 7)$ $\frac{7p}{7} = \frac{35}{7}$

$p = 5$

Check

L.S. $= 7p - 1$ *R.S.* $= 34$
$= 7(5) - 1$
$= 35 - 1$
$= 34$

L.S. = R.S, The solution is p = 5.