



Warm Up Grade 8

Oct. 16, 2017

1) Evaluate the expression $5x + 20$ for $x = 6$

$$\begin{aligned}
 & 5x + 20 \\
 = & 5(6) + 20 \\
 = & 30 + 20 \\
 = & 50
 \end{aligned}$$

2) Evaluate the expression $4x - 7$ for $x = 1$, then for $x = 2$ and $x = 4$

$$4x - 7$$

$$x = 1$$

$$\begin{aligned}
 & 4x - 7 \\
 = & 4(1) - 7 \\
 = & 4 - 7 \\
 = & -3
 \end{aligned}$$

(Input, Output)
(1, -3)

$$x = 2$$

$$\begin{aligned}
 & 4x - 7 \\
 = & 4(2) - 7 \\
 = & 8 - 7 \\
 = & 1
 \end{aligned}$$

(2, 1)

$$x = 4$$

$$\begin{aligned}
 & 4x - 7 \\
 = & 4(4) - 7 \\
 = & 16 - 7 \\
 = & 9
 \end{aligned}$$

(4, 9)

Worksheet Solutions

a) $3b = 3(5) = 15$
 b) $6a = 6(2) = 12$
 c) $2c = 2(7) = 14$
 d) $4b = 4(5) = 20$
 e) $3c = 3(7) = 21$

f) $2b+3 = 2(5)+3 = 10+3 = 13$
 g) $3a+1 = 3(2)+1 = 6+1 = 7$
 h) $2c-3 = 2(7)-3 = 14-3 = 11$
 i) $5a+7 = 5(2)+7 = 10+7 = 17$
 j) $9b = 9(5) = 45$

k) $a+b = 2+5 = 7$
l) $a+c = 2+7 = 9$
m) $c-b = 7-5 = 2$
n) $a+b+c = 2+5+7 = 14$
o) $-a = -(2) = -2$

p) $3a+2b = 3(3)+2(5) = 9+10 = 19$
q) $5c+2a = 5(7)+2(2) = 35+4 = 39$
r) $3b+2c = 3(5)+2(7) = 15+14 = 29$
s) $9a-2b = 9(2)-2(5) = 18-10 = 8$
t) $-3c = -3(7) = -21$

2a) $3b = 3(4) = 12$
b) $6a = 6(3) = 18$
c) $2c = 2(10) = 20$
d) $4b = 4(4) = 16$
e) $3c = 3(10) = 30$

f) $2b+3 = 2(4)+3 = 8+3 = 11$
g) $3a+1 = 3(3)+1 = 9+1 = 10$
h) $2c-3 = 2(10)-3 = 20-3 = 17$
i) $5a+7 = 5(3)+7 = 15+7 = 22$
j) $9b = 9(4) = 36$

k) $a+b = 3+4 = 7$
l) $a+c = 3+10 = 13$
m) $c-b = 10-4 = 6$
n) $a+b+c = 3+4+10 = 17$
o) $-a = -3$

p) $3a+2b = 3(3)+2(4) = 9+8 = 17$
q) $5c+2a = 5(10)+2(3) = 50+6 = 56$
r) $3b+2c = 3(4)+2(10) = 12+20 = 32$
s) $9a-2b = 9(3)-2(4) = 27-8 = 19$

Step 2)

4) $a) \begin{cases} x+y=7 \\ y+2=7 \end{cases}$
b) $\begin{cases} x+y=6 \\ x+y=5 \end{cases}$
c) $\begin{cases} x-y=2 \\ z-x=2 \end{cases}$
d) $\begin{cases} 2x+3y=16 \\ 2x+3y=16 \end{cases}$

5) $10n+30 = \text{Cost to rent}$ when n is # of hours to rent

a) $10(1)+30 = 10+30 = 40$
b) $10(3)+30 = 30+30 = 60$
c) $10(4)+30 = 40+30 = 70$

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#1, #2, #3, #4, #7, #9, #10

Homework

Solutions

$$1a) 4x = -36$$

$$b) -7x = 63$$

$$\frac{-7x}{-7} = \frac{63}{-7}$$

$$x = -9$$

$$c) 4x + 7 = 19$$

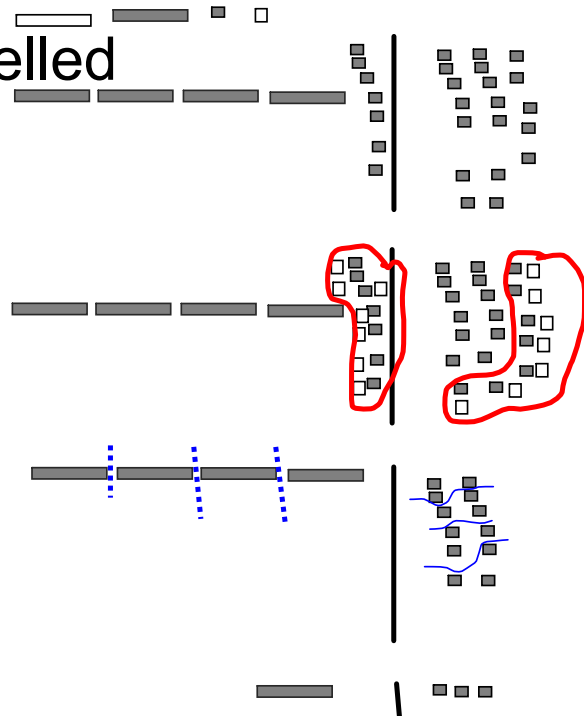
$$4x + 7 - 7 = 19 - 7$$

$$4x = 12$$

$$\frac{4x}{4} = \frac{12}{4}$$

$$x = 3$$

4c modelled



$$d) -3x + 5 = 17$$

$$-3x + 5 - 5 = 17 - 5$$

$$-3x = 12$$

$$\frac{-3x}{-3} = \frac{12}{-3}$$

$$x = -4$$

2 g = number of bars

$$3g + 4 = 13$$

$$3g + 4 - 4 = 13 - 4$$

$$3g = 9$$

$$\frac{3g}{3} = \frac{9}{3}$$

$$g = 3$$

Alice has 3 bars.

$$\begin{array}{l} \text{LS} \\ 3g + 4 \\ 3 \times 3 + 4 \\ 9 + 4 \\ 13 \end{array}$$

$$\begin{array}{l} \text{RS} \\ 13 \end{array}$$

3)

a) $4x + 9 = -27$

$$4x + 9 - 9 = -27 - 9$$

$$4x = -36$$

$$\frac{4x}{4} = \frac{-36}{4}$$

$$x = -9$$

$$x = -9$$

b) $-5x + 8 = 23$

$$-5x + 8 - 8 = 23 - 8$$

$$-5x = 25$$

$$\frac{-5x}{-5} = \frac{25}{-5}$$

$$x = -5$$

$$x = -5$$

c) $3x - 4 = -3$

$$3x - 4 + 4 = -3 + 4$$

$$3x = 1$$

$$\frac{3x}{3} = \frac{1}{3}$$

$$x = \frac{1}{3}$$

$$x = \frac{1}{3}$$

c) $10 = 6x + 5$

$$6x + 5 = 10$$

$$6x + 5 - 5 = 10 - 5$$

$$6x = 5$$

$$\frac{6x}{6} = \frac{5}{6}$$

$$x = \frac{5}{6}$$

$$x = \frac{5}{6}$$

4. $p =$ number of people

$$12p + 125 = 545$$

$$12p + 125 - 125 = 545 - 125$$

$$12p = 420$$

$$\frac{12p}{12} = \frac{420}{12}$$

$$p = 35$$

35 people attended the banquet

$$\begin{array}{r} \text{LJ} \\ 12p + 125 \\ 12 \times 35 + 125 \\ 420 + 125 \\ 545 \end{array} \quad \begin{array}{r} \text{RJ} \\ 545 \end{array}$$

5a) $\frac{n}{4} = -8$

$$4 \times \frac{n}{4} = -8 \times 4$$

$$n = -32$$

b) $\frac{m}{3} - 2 = 3$

$$\frac{m}{3} - 2 + 2 = 3 + 2$$

$$\frac{m}{3} = 5$$

$$3 \times \frac{m}{3} = 5 \times 3$$

$$m = 15$$

c) $\frac{b}{-3} = 6$

$$-3 \times \frac{b}{-3} = 6 \times -3$$

$$b = -18$$

d) $\frac{f}{-8} + 8 = 12$

$$\frac{f}{-8} + 8 - 8 = 12 - 8$$

$$\frac{f}{-8} = 4$$

$$-8 \times \frac{f}{-8} = 4 \times -8$$

$$f = -32$$

6) $\frac{n}{-7} = 4$

$$-7 \times \frac{n}{-7} = 4 \times -7$$

$$n = -28$$

b) $\frac{p}{9} = -3$

$$-9 \times \frac{p}{9} = -3 \times -9$$

$$p = 27$$

c) $\frac{n}{2} + 5 = 0$

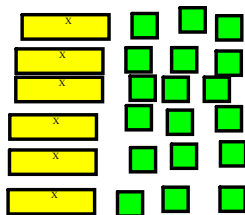
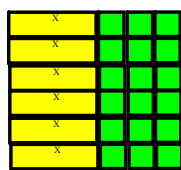
$$\frac{n}{2} + 5 - 5 = 0 - 5$$

$$\frac{n}{2} = -5$$

$$-2 \times \frac{n}{2} = -5 \times -2$$

$$n = 10$$

$$7. 6(a+3) = 18+6a$$



8. orally

$$\begin{aligned} 9 \text{ a) } 3(x+2) &= 21 \\ 3x+6 &= 21 \\ 3x+6-6 &= 21-6 \\ 3x &= 15 \\ \frac{3x}{3} &= \frac{15}{3} \\ x &= 5 \end{aligned}$$

verify

$$\begin{aligned} \text{b) } 4(p-3) &= 16 \\ 4p-12 &= 16 \\ 4p-12+12 &= 16+12 \\ 4p &= 28 \\ \frac{4p}{4} &= \frac{28}{4} \\ p &= 7 \end{aligned}$$

$$\begin{aligned} \text{c) } -5(r+4) &= -15 \\ -5r-20 &= -15 \\ -5r-20+20 &= -15+20 \\ -5r &= 5 \\ \frac{-5r}{-5} &= \frac{5}{-5} \\ r &= -1 \end{aligned}$$

$$\begin{aligned} \text{d) } 6(-5-3) &= 24 \\ -6s-18 &= 24 \\ -6s-18+18 &= 24+18 \\ -6s &= 42 \\ \frac{-6s}{-6} &= \frac{42}{-6} \\ s &= -7 \end{aligned}$$

10. $s =$ number of points

$$\begin{aligned}2(s+6) &= 26 \\2s+12 &= 26 \\2s+12-12 &= 26-12 \\2s &= 14 \\\frac{2s}{2} &= \frac{14}{2} \\s &= 7\end{aligned}$$

He started with
7 points.

LS	RS
$2(s+6)$	26
$2(7+6)$	
2×13	
26	

Using Tables



You can use tables and charts to help you solve equations.

Sometimes you will be given the equations (output) and you will be asked to complete the table or find the missing numbers. Other times you will be given the table and you will be able to figure out the equations.

Complete the following tables: _____

Ordered pairs are (x, y)

	Input x	Output $2x + 4$	Ordered Pairs <i>Input, output</i>
*	1	6 $\swarrow +2$	(1, 6)
*	2	8 $\swarrow +2$	(2, 8)
*	3	10 $\swarrow +2$	(3, 10)
	4	12 $\swarrow +2$	(4, 12)
	5	14 $\swarrow +2$	(5, 14)

• As input increases by 1, output increases by 2

$$\begin{array}{l}
 2x + 4 \\
 x = 1 \\
 2(1) + 4 \\
 2 + 4 \\
 6
 \end{array}
 \left.
 \begin{array}{l}
 x = 2 \\
 2x + 4 \\
 2(2) + 4 \\
 4 + 4 \\
 8
 \end{array}
 \right\}$$

$$\begin{array}{l}
 x = 3 \\
 2x + 4 \\
 2(3) + 4 \\
 6 + 4 \\
 10
 \end{array}$$

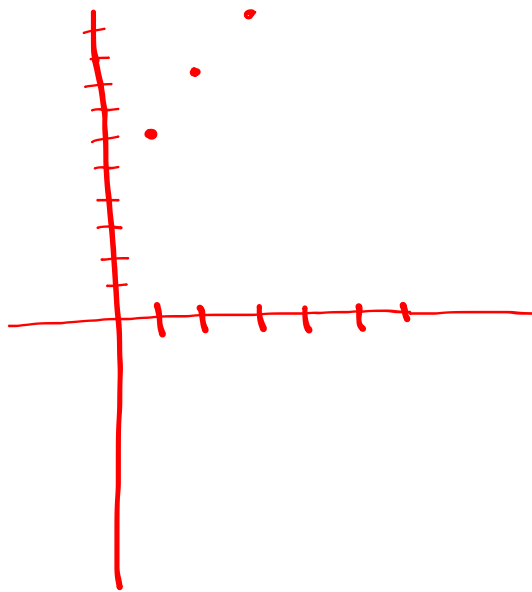
b)

	Input x	Output $-3x + 2$	Ordered Pairs
+1	1	-1 $\swarrow -3$	(1, -1)
	2	-4 $\swarrow -3$	(2, -4)
	3	-7 $\swarrow -3$	(3, -7)
	4	-10 $\swarrow -3$	(4, -10)
	5	-13 $\swarrow -3$	(5, -13)

As input increases by 1 the output decreases by 3

$$\begin{array}{l}
 x = 1 \\
 -3x + 2 \\
 -3(1) + 2 \\
 -3 + 2 \\
 -1
 \end{array}
 \left.
 \begin{array}{l}
 x = 2 \\
 -3x + 2 \\
 -3(2) + 2 \\
 -6 + 2 \\
 -4
 \end{array}
 \right\}$$

$$\begin{array}{l}
 x = 3 \\
 -3x + 2 \\
 -3(3) + 2 \\
 -9 + 2 \\
 -7
 \end{array}$$



Using Tables

You can use tables and charts to help you solve equations.

Sometimes you will be given the equations (output) and you will be asked to complete the table or find the missing numbers. Other times you will be given the table and you will be able to figure out the equations.

Complete the following tables: _____

Input x	Output $2x + 4$	Ordered Pairs
1	6	(1, 6)
2	8	(2, 8)
3	10	(3, 10)
4	12	(4, 12)
5	14	(5, 14)

$$2 \times 1 + 4$$

$$2 \times 2 + 4$$

$$2 \times 3 + 4$$

Input x	Output $-3x + 2$	Ordered Pairs
1	-1	(1, -1)
2	-4	(2, -4)
3	-7	(3, -7)
4	-10	(4, -10)
5	-13	(5, -13)

$$-3 \times 1 + 2$$

x y



The equation is $y = -3x + 4$. Find the missing number in each ordered pair.

In out
 a) $(-2, \underline{\quad})$
 x, y

$$y = -3x + 4$$

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

$$= +6 + 4$$

$$\boxed{y = +10}$$

$$(-2, +10)$$

b) $(\underline{\quad}, -38)$

$$y = -3x + 4$$

$$\downarrow$$

$$-38 = -3x + 4$$

$$\underline{-38}^4 = -3x + 4 - 4$$

$$-42 = -3x$$

$$\frac{-42}{-3} = \frac{-3x}{-3}$$

$$\boxed{+14 = x}$$



$$y = -2x + 7$$

$$a) \begin{matrix} x, y \\ (4, -) \end{matrix}$$

$$y = -2x + 7$$

$$y = -2(4) + 7$$

$$y = -8 + 7$$

$$y = -1$$

$$(4, -1)$$

$$b) \begin{matrix} x, y \\ (-, -3) \end{matrix}$$

$$y = -2x + 7$$

↓

$$-3 = -2x + 7$$

$$\underline{-3} - 7 = -2x + 7 - 7$$

$$-10 = -2x$$

$$\frac{-10}{-2} = \frac{-2x}{-2}$$

$$+5 = x$$

Class/Homework

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[# 4(b,c), #5(a,c), #6, #7, #8(b), #11, #12(Like a test question)

$$\begin{array}{r}
 x \quad y \\
 +1 \quad 0 \quad -1 \quad +9 \\
 \hline
 5 \quad 2 \quad 1 \quad 6 \\
 \hline
 5 \quad 2 \quad 1 \quad 6
 \end{array}$$