



Warm Up Grade 8

April 18, 2017



Jack and Diane went to the movies.
 They each paid the same amount for an admission ticket.
 Together, they spent \$12 on snacks.
 The total cost of admission and snacks for Jack and Diane was \$26.
 How much was each admission ticket?

a) Choose a variable.

Write an equation you could use to solve this problem.

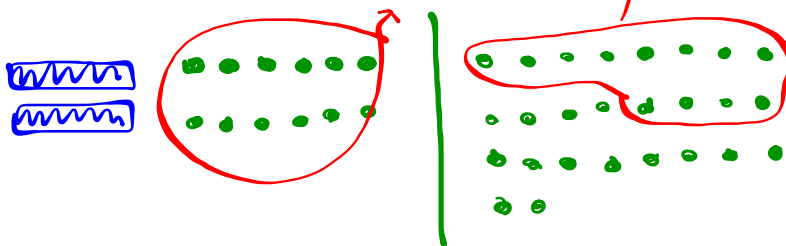
b) Use a model to solve the equation.

c) Verify the solution.

t represent cost of movie ticket

a) Cost = $2t + 12$

b) $2t + 12 = 26$



$$2t + 12 - 12 = 26 - 12$$

$$\frac{2t}{2} = \frac{14}{2}$$

$$t = 7$$

The price of the movie ticket is 7

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1. When the numbers are larger it is easier to use algebra rather than tiles or scales
2. It is easier to verify using algebra when the answer is a fraction or a decimal.
3. You have to keep the balance and do the same thing on both sides.
4. Student's choice
(most would chose a decimal, and use a calculator).

$$5a) 2x - 1 = 7$$

$$2x - 1 + 1 = 7 + 1$$

$$2x = 8$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$x = 4$$

$$\begin{array}{l} \text{LS} \\ 2x - 1 \\ 2 \times 4 - 1 \\ 8 - 1 \\ 7 \end{array}$$

$$\begin{array}{l} \text{RS} \\ 7 \end{array}$$

$$b) 11 = 4a - 1$$

$$11 + 1 = 4a - 1 + 1$$

$$12 = 4a$$

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

$$3 = a$$

$$\begin{array}{l} \text{LS} \\ 11 \end{array}$$

$$\begin{array}{l} \text{RS} \\ 4a - 1 \\ 4 \times 3 - 1 \\ 12 - 1 \\ 11 \end{array}$$

$$c) 5 + 2m = 9$$

$$\underline{5 + 2m - 5} = 9 - 5$$

$$2m = 4$$

$$\frac{2m}{2} = \frac{4}{2}$$

$$m = 2$$

$$\begin{array}{l} \text{LS} \\ 5 + 2m \\ 5 + 2 \times 2 \\ 5 + 4 \\ 9 \end{array}$$

$$\begin{array}{l} \text{RS} \\ 9 \end{array}$$

$$d) 1 = 10 - 3x$$

$$1 - 10 = \underline{10 - 3x} - \underline{10}$$

$$-9 = -3x$$

$$\frac{-9}{-3} = \frac{-3x}{-3}$$

$$\frac{-9}{-3} = \frac{-3x}{-3}$$

$$-3 = -x$$

$$3 = x$$

$$3 = x$$

LS
1

RS

$$\begin{array}{r} 10 - 3x \\ 10 - 3x - 3 \\ 10 - 9 \\ 1 \end{array}$$

$$e) 13 - 2x = 5$$

$$13 - 2x - 13 = 5 - 13$$

$$-2x = -8$$

$$\frac{-2x}{-2} = \frac{-8}{-2}$$

$$x = 4$$

LS

$$\begin{array}{r} 13 - 2x \\ 13 - 2x - 4 \\ 13 - 8 \\ 5 \end{array}$$

RS

$$\begin{array}{r} 5 \\ 5 \end{array}$$

$$f) 3x - 6 = 12$$

$$3x - 6 + 6 = 12 + 6$$

$$3x = 18$$

$$\frac{3x}{3} = \frac{18}{3}$$

$$x = 6$$

LS

$$\begin{array}{r} 3x - 6 \\ 3x - 6 - 6 \\ 18 - 6 \\ 12 \end{array}$$

RS

$$\begin{array}{r} 12 \\ 12 \end{array}$$

$$b) 4x = -16$$

$$\frac{4x}{4} = \frac{-16}{4}$$

$$x = -4$$

$$\begin{array}{l} \text{LS} \\ 4x \\ 4x - 4 \\ + 6 \end{array}$$

$$\begin{array}{l} \text{RS} \\ -16 \end{array}$$

$$b) 12 = -3x$$

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

$$-4 = x$$

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

$$4 = -x$$

$$-4 = x$$

$$\begin{array}{l} \text{LS} \\ 12 \end{array}$$

$$\begin{array}{l} \text{RS} \\ -3x \\ -3x - 4 \\ + 12 \end{array}$$

$$c) -21 = 7x$$

$$\frac{-21}{7} = \frac{7x}{7}$$

$$-3 = x$$

$$\begin{array}{l} \text{LS} \\ -21 \end{array}$$

$$\begin{array}{l} \text{RS} \\ 7x \\ 7x - 3 \\ - 21 \end{array}$$

$$d) 6x = -30$$

$$\frac{6x}{6} = \frac{-30}{6}$$

$$x = -5$$

$$\begin{array}{l} \text{LS} \\ 6x \\ 6x - 5 \\ - 30 \end{array}$$

$$\begin{array}{l} \text{RS} \\ -30 \end{array}$$

7. a) mistake

In 2nd step, the student added and subtracted 15 from the right side.

$$\begin{aligned}
 -3x + 15 &= 30 \\
 -3x + 15 - 15 &= 30 - 15 \\
 -3x &= 15 \\
 \frac{-3x}{3} &= \frac{15}{3} \\
 -x &= 5 \\
 x &= -5
 \end{aligned}$$

b) mistake, student said $7 - 1 = 8$ instead of 6

$$\begin{aligned}
 7 &= 1 + 2n \\
 7 - 1 &= 1 + 2n - 1 \\
 6 &= 2n \\
 \frac{6}{2} &= \frac{2n}{2} \\
 3 &= n
 \end{aligned}$$

c) mistake - in 3rd step, the student should have divided by 2, and he mult. by 2

$$\begin{aligned}
 3 + 2t &= 4 \\
 3 + 2t - 3 &= 4 - 3 \\
 2t &= 1 \\
 \frac{2t}{2} &= \frac{1}{2} \\
 t &= \frac{1}{2}
 \end{aligned}$$

d) No mistake

$$\begin{aligned}
 8a) \quad 2x + 5 &= -7 \\
 2x + 5 - 5 &= -7 - 5 \\
 2x &= -12 \\
 \frac{2x}{2} &= \frac{-12}{2} \\
 x &= -6
 \end{aligned}$$

LS	RS
$2x + 5$	-7
$2x - 6 + 5$	
$-12 + 5$	
-7	

$$\begin{aligned}
 b) \quad -3x + 11 &= 2 \\
 -3x + 11 - 11 &= 2 - 11 \\
 -3x &= -9 \\
 \frac{-3x}{-3} &= \frac{-9}{-3} \\
 x &= 3
 \end{aligned}$$

LS	RS
$-3x + 11$	2
$-3 \times 3 + 11$	
$-9 + 11$	
2	

$$\begin{aligned}c) \quad -9 &= 5 + 7x \\ -9 - 5 &= 5 + 7x - 5 \\ -14 &= 7x \\ \frac{-14}{7} &= \frac{7x}{7} \\ -2 &= x\end{aligned}$$

LS
-9

RS
5 + 7x
5 + 7x - 2
5 + -14
-9

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9. a) $n =$ number of week

$$24n + 72 = 288$$

$$24n + 72 - 72 = 288 - 72$$

$$24n = 216$$

$$\frac{24n}{24} = \frac{216}{24}$$

$$n = 9$$

$\begin{array}{r} \text{L.S.} \\ 24n + 72 \\ 24 \times 9 + 72 \\ 216 + 72 \\ 288 \end{array}$	$\begin{array}{r} \text{R.S.} \\ 288 \end{array}$
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In 9 weeks, Navid will have the money in her account.

10.

a) $n =$ number of students

$$2n + 85 = 197$$

$$2n + 85 - 85 = 197 - 85$$

$$2n = 112$$

$$\frac{2n}{2} = \frac{112}{2}$$

$$n = 56$$

$\begin{array}{r} \text{L.S.} \\ 2n + 85 \\ 2 \times 56 + 85 \\ 112 + 85 \\ 197 \end{array}$	$\begin{array}{r} \text{R.S.} \\ 197 \end{array}$
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56 students attended the dance.

Class/Homework

Page 332 #11 (use algebra) and always check (verify means sub back in)
abcd

Worksheet 2 : Solve using algebra



Sheet

and always check (verify, means sub back in)

1ab
2bc
3ab
4ab
5ab
6ab

Attachments

Extra Practice 2 Solve using algebra.pdf