Warm Up Grade 8

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?

↗ letter $2x$

$2x + 12 = 26$

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.

a) let x represent admission cost

b) $2x + 12 = 26$
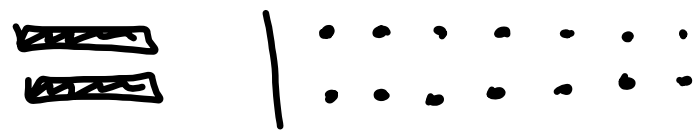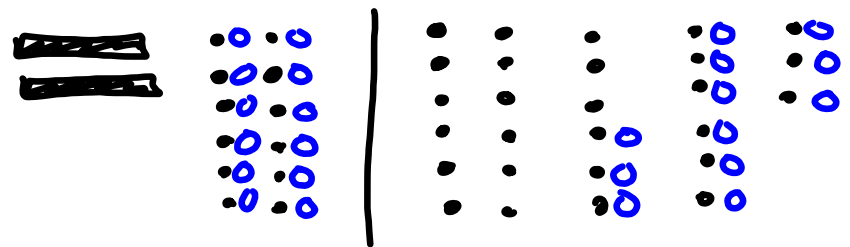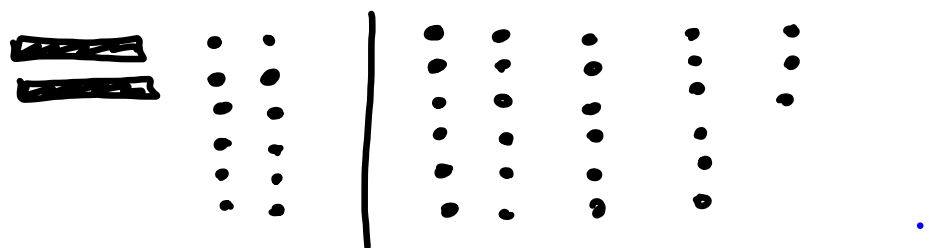
$$x = 7$$

The admission price 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) $2x - 1 = 7$

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

$2x = 8$

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

$x = 4$

LS
$2x - 1$
$2 \times 4 - 1$
$8 - 1$
7

RS
7

b) $11 = 4a - 1$

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

$12 = 4a$

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

$3 = a$

LS
11

RS
$4a - 1$
$4 \times 3 - 1$
$12 - 1$
11

c) $5 + 2m = 9$

$5 + 2m - 5 = 9 - 5$

$2m = 4$

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

$m = 2$

LS
$5 + 2m$
$5 + 2 \times 2$
$5 + 4$
9

RS
9

d) $1 = 10 - 3x$

$1 - 10 = 10 - 3x - 10$

$-9 = -3x$

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

$3 = x$

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

$-3 = -x$

$3 = x$

LS   RS
1 $10 - 3x$
      $10 - 3 \times 3$
      $10 - 9$
      1

e) $13 - 2x = 5$

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

$-2x = -8$

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

$x = 4$

LS   RS
$13 - 2x$ 5
$13 - 2 \times 4$
$13 - 8$
5

f) $3x - 6 = 12$

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

$3x = 18$

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

$x = 6$

LS   RS
$3x - 6$ 12
$3 \times 6 - 6$
$18 - 6$
12

6a) $4x = -16$

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

$$x = -4$$

LS
$4x$
$4x - 4$
-16

RS
-16

b) $12 = -3x$

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

$$-4 = x$$

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

$$4 = -x$$

$$-4 = x$$

LS
12

RS
$-3x$
$-3x - 4$
$+12$

c) $-21 = 7x$

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

$$-3 = x$$

LS
-21

RS
$7x$
$7x - 3$
-21

d) $6x = -30$

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

$$x = -5$$

LS
$6x$
$6x - 5$
-30

RS
-30

5

7.

a) mistake

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

$$-3x + 15 = 30$$
$$-3x + 15 - 15 = 30 - 15$$
$$-3x = 15$$
$$\frac{-3x}{3} = \frac{15}{3}$$
$$-x = 5$$
$$x = -5$$

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

$$7 = 1 + 2n$$
$$7 - 1 = 1 + 2n - 1$$
$$6 = 2n$$
$$\frac{6}{2} = \frac{2n}{2}$$
$$3 = n$$

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

$$3 + 2t = 4$$
$$3 + 2t - 3 = 4 - 3$$
$$2t = 1$$
$$\frac{2t}{2} = \frac{1}{2}$$
$$t = \frac{1}{2}$$

d) No mistake

8a) $2x + 5 = -7$

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

$2x = -12$

$\dfrac{2x}{2} = \dfrac{-12}{2}$

$x = -6$

1

LS　　　　　RS
2x+5　　　　-7
2x-6+5
-12+5
7

b) $-3x + 11 = 2$

$-3x + 11 - 11 = 2 - 11$

$-3x = -9$

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

$-x = -3$

$x = 3$

LS　　　　　RS
-3x+11　　　2
-3×3+11
9+11
2

7

c) $-9 = 5 + 7x$

$-9 - 5 = 5 + 7x - 5$

$-14 = 7x$

$\dfrac{-14}{7} = \dfrac{7x}{7}$

$-2 = x$

$\begin{array}{ll} \text{LS} & \text{RS} \\ -9 & 5 + 7x \\ & 5 + 7x - 2 \\ & 5 + ^-14 \\ & -9 \end{array}$

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9. a) n = number of week

$$24n + 72 = 288$$

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

$$24n = 216$$

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

$$n = 9$$

LJ	RS
$24n + 72$	288
$24 \times 9 + 72$	
$216 + 72$	
288	

In 9 weeks, Navid will have the money in her account.

10.

a) n = number of students

$$2n + 85 = 197$$

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

$$2n = 112$$

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

$$n = 56$$

LJ	RS
$2n + 85$	197
$2 \times 56 + 85$	
$112 + 85$	
197	

56 students attended the dance.

Class/Homework

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

Worksheet 2 : Solve using algebra
and always check (verify, means sub back in)

Attachments

Extra Practice 2 Solve using algebra.pdf