



Warm Up Grade 7



1) Suppose the masses of balance scales are only available in multiples of 4 g.

a) Sketch balance scales to represent this equation:  $x + 24 = 40$



$$x + 24 = 40 - 24$$



$$x = 16$$

b) Solve the equation. Verify the solution (Show your work)

L H S	R H S
$x + 24$	40
$\downarrow$ 16 + 24 40	Same ✓

$$2x + 7 = 17$$

$$2x + 7^{-7} = 17^{-7}$$

$$2x \underset{\div 2}{=} 10 \underset{\div 2}{}$$

$$x = 5$$

## Sheet 13b

a)  $n + 12 = 20$

(iv)

b)  $20 = 3n + 8$

(iv)

c)  $22 = 3n + 20$

(iv)

d)  $n + 8 = 22$

(i)

2a)  $a + 2 = 7$

$$a + 2 - 2 = 7 - 2$$

$$a = 5$$

b)  $b + 6 = 11$

$$b + 6 - 6 = 11 - 6$$

$$b = 5$$

c)  $10 = c + 5$

$c + 5 = 10$

$$c + 5 - 5 = 10 - 5$$

$$c = 5$$

If you change to the other side of equal sign, that's fine

d)  $15 = d + 10$

$$15 - 10 = d + 10 - 10$$

$$5 = d$$

$$\begin{aligned} 3a) \quad 25 &= a + 10 \\ 25 - 10 &= a + 10 - 10 \\ 15 &= a \end{aligned}$$

$$\begin{aligned} b) \quad b + 6 &= 24 \\ b + 6 - 6 &= 24 - 6 \\ b &= 18 \end{aligned}$$

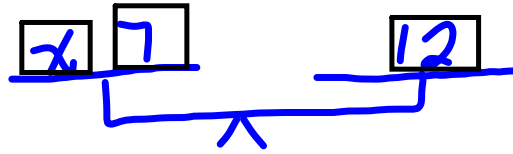
$$\begin{aligned} c) \quad 30 &= c + 20 \\ 30 - 20 &= c + 20 - 20 \\ 10 &= c \end{aligned}$$

$$\begin{aligned} d) \quad 2d + 6 &= 18 \\ 2d + 6 - 6 &= 18 - 6 \\ 2d &= 12 \\ \frac{2d}{2} &= \frac{12}{2} \\ d &= 6 \end{aligned}$$

$$4a) \quad x + 7 = 12$$

$$x + 7 - 7 = 12 - 7$$

$$x = 5$$



$$b) \quad n + 18 = 22$$

$$n + 18 - 18 = 22 - 18$$

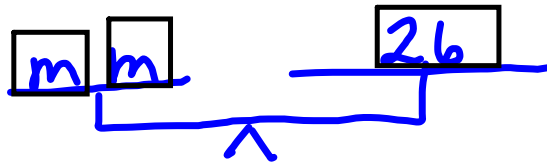
$$n = 4$$



$$c) \quad 2m = 26$$

$$\frac{2m}{2} = \frac{26}{2}$$

$$m = 13$$



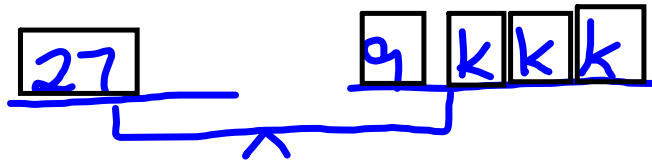
$$d) \quad 27 = 9 + 3k$$

$$27 - 9 = 9 + 3k - 9$$

$$18 = 3k$$

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

$$6 = k$$



5  $n =$  the number

$$\begin{aligned} \text{a) } n + 2 &= 12 \\ n + 2 - 2 &= 12 - 2 \\ n &= 10 \end{aligned}$$

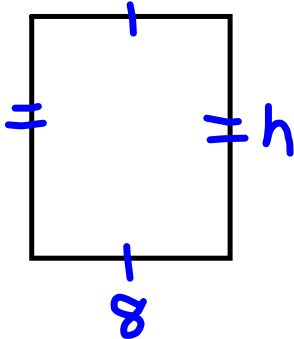
$$\begin{aligned} \text{b) } n + 9 &= 21 \\ n + 9 - 9 &= 21 - 9 \\ n &= 12 \end{aligned}$$

$$\begin{aligned} \text{c) } 4n &= 24 \\ \frac{4n}{4} &= \frac{24}{4} \\ n &= 6 \end{aligned}$$

$$n/n/n/n$$

$$\begin{aligned} \text{d) } 4 + 3n &= 28 \\ 4 + 3n - 4 &= 28 - 4 \\ 3n &= 24 \\ \frac{3n}{3} &= \frac{24}{3} \\ n &= 8 \end{aligned}$$

6.



$$\begin{aligned} \text{Per} &= s + t + s + t \\ &= 8 + h + 8 + h \\ &= 2h + 16 \end{aligned}$$

$$\text{Per} = 44$$

$$2h + 16 = 44$$

$$2h + 16 - 16 = 44 - 16$$

$$2h = 28$$

$$\frac{2h}{2} = \frac{28}{2}$$

$$h = 14$$

$$\frac{120}{15} = \frac{28}{2}$$

The height  
is 14

$$7. A = b \times h$$

$$120 = 15 \times h$$

$$\frac{120}{15} = \frac{15h}{15}$$

$$8 = h$$

The height is 8cm

## Solving Equations with Integers

### Review

#### Adding Integers

To add 2 positive integers, add the numbers and the answer will be positive.

$$(+5) + (+6) = +11$$

To add 2 negative integers, add the numbers and the answer will be negative.

$$(-4) + (-6) = -10$$

To add a positive and a negative integer, subtract the number and keep the sign of the larger number.

$$(-10) + (+7) = -3$$

$$(+20) + (-5) = +15$$

#### Subtracting Integers add the opposite

To subtract integers, the first number stays the same, the subtract sign changes to addition and the number after the subtraction sign changes to its opposite.(Then use addition rules)

$$(+7) - (-11)$$

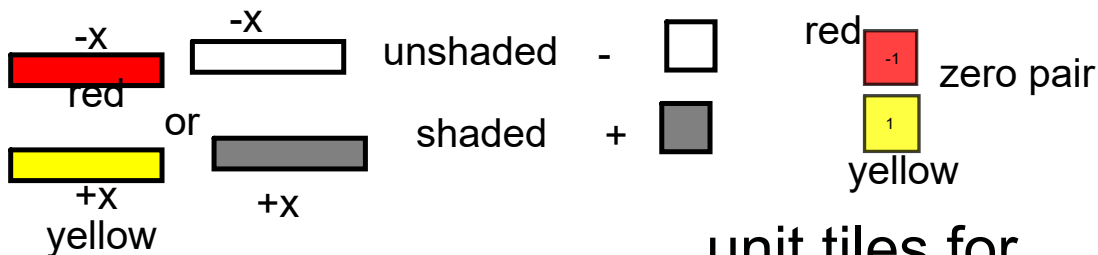
add opposite

$$(+7) + (+11) = +18$$

$$(-3) - (-8)$$

add opposite

$$(-3) + (+8) = +5$$

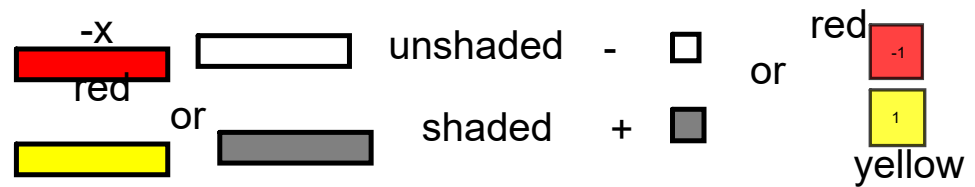


Variable

unit tiles for



Remember from Section 1.8 solving using algebra tiles pg 38

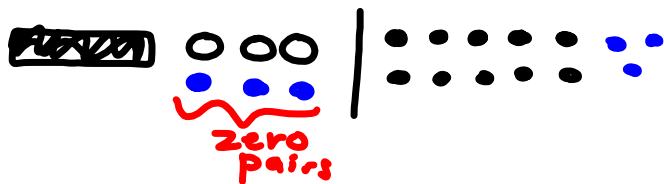


Model with algebra tiles

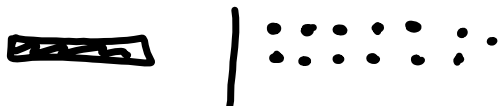
$$p - 3 = 10$$



$$P - 3 = 10$$



$$P - 3 + 3 = 10 + 3$$



$$P = 13$$



Steven friends came to his birthday party. Seven of his friends left at 8:00. Four friends stayed for the sleep over. Write an equation you can use to find how many of Steven's friends attended his birthday party. Solve the equations. Verify the solution.

Use tiles *let  $x \equiv$  # of friend who attended Steven's b-day party.*

$$x - 7 = 4$$

$$x - 7 = 4$$

$$x = 11$$

Equations with Integers

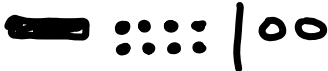
Solve for the variable using algebra and integer rules

$$5 - 7 = -4$$

$$S = (+3)$$

Ex 1)

$$r + 8 = -2$$



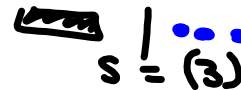
$$r + 8 = -2$$

$$\cancel{r} + \cancel{8} = -2$$

$$r = -10$$

Ex 2)

$$s - 7 = -4$$



# *Class / Homework*

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#1 (Sketch Algebra tiles) <sup>a,c,e</sup>

~~#2 (inspection)~~

#3

#4

#5

#6

Use integers

~~#7~~

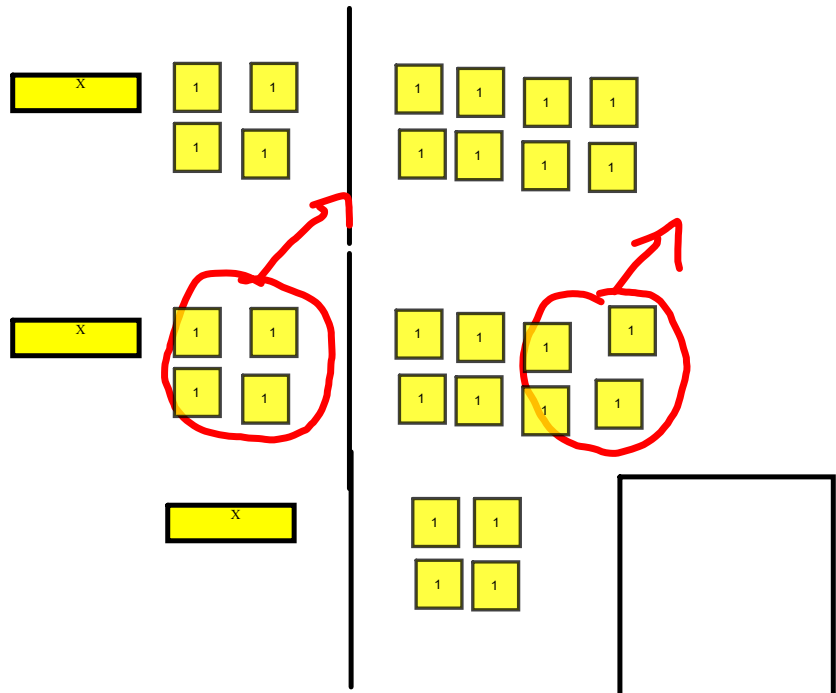
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1a)

$$x + 4 = 8$$

$$x + 4 - 4 = 8 - 4$$

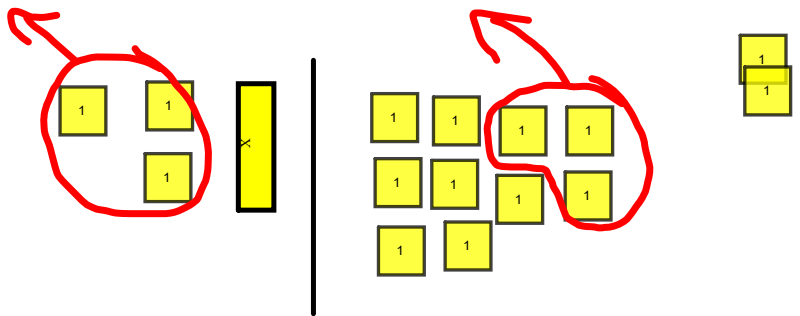
$$x = 4$$



b)  $3 + x = 10$

$$3 + x - 3 = 10 - 3$$

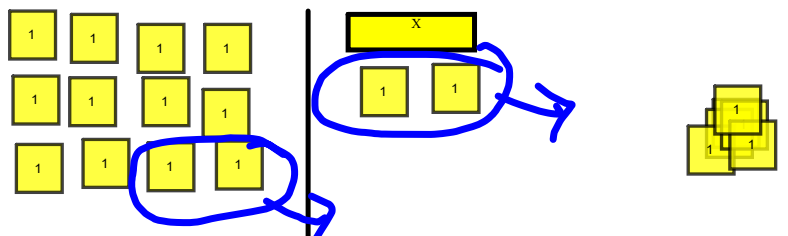
$$x = 7$$



c)  $12 = x + 2$

$$12 - 2 = x + 2 - 2$$

$$10 = x$$

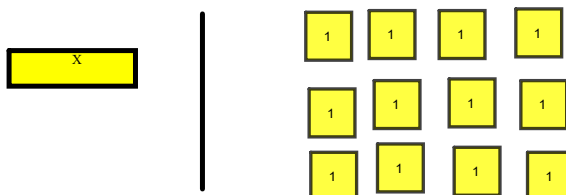
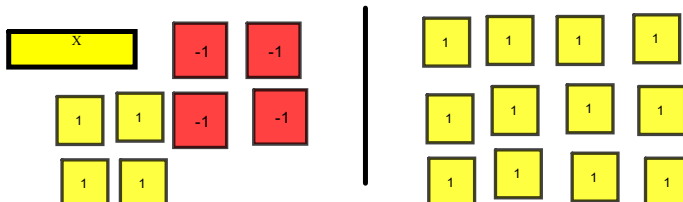
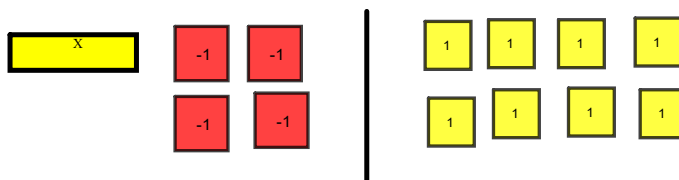


d)  $x - 4 = 8$

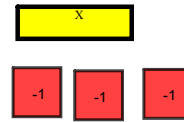
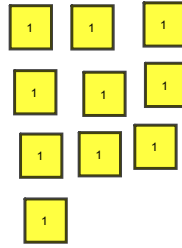
$x + (-4) = 8$

$x - 4 + 4 = 8 + 4$

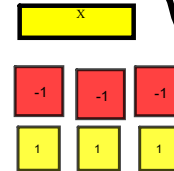
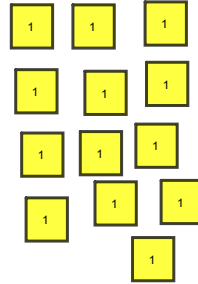
$x = 12$



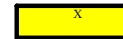
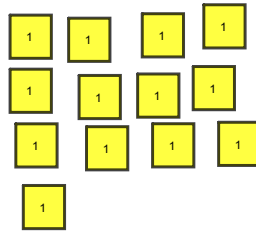
e)  $10 = x - 3$



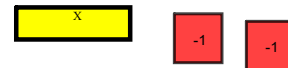
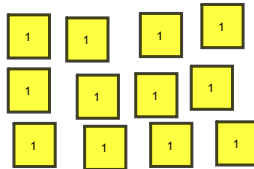
$10 + 3 = x - 3 + 3$



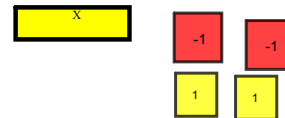
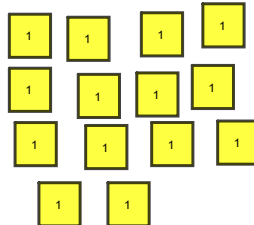
$13 = x$



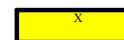
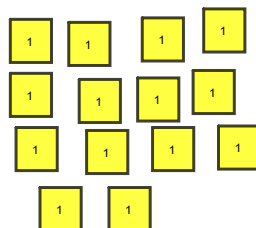
f)  $12 = x - 2$



$12 + 2 = x - 2 + 2$



$x = 14$



Inspection

$$2a) 9 = n - 4$$

$$13 = n$$

$$b) x + 6 = 8$$

$$x =$$

$$c) 2 = p - 5$$

$$7 = p$$

$$d) x - 4 = -9$$

$$\underline{-5} + -4 = -9$$

$$e) -8 = s + 6$$

$$-14 = s$$

$$f) x - 5 = -2$$

$$3. x - 4 = 13$$

$$x - 4 + 4 = 13 + 4$$

$$x = 17$$



$$(-8) - (+3)$$

$$(-8) + (-3)$$

$$-11$$

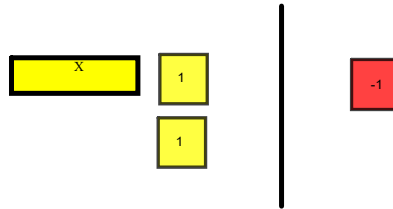
$$(+7) - (-2)$$

$$(+7) + (+2)$$

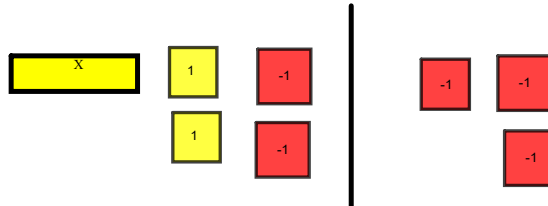
$$+9$$

# Sketch Diagram for Equations with Integers

a)  $x + 2 = -1$



$x + 2 + (-2) = -1 + -2$

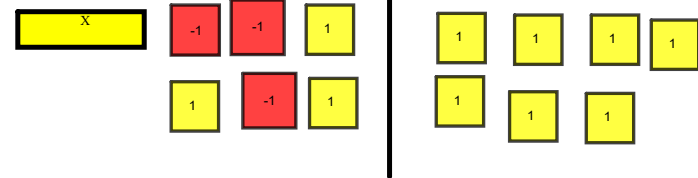
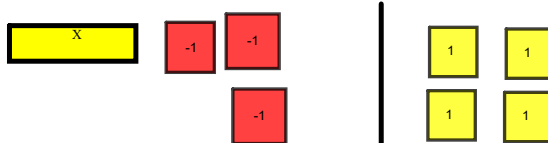


$x = -3$

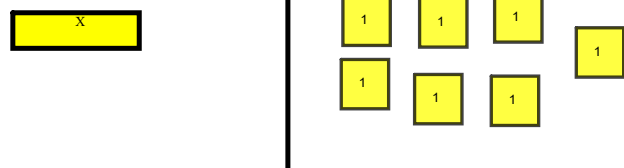
b)  $x - 3 = 4$

$x + (-3) = 4$

$x - 3 + 3 = 4 + 3$



$x = 7$



Homework

- pg 234 # 1 - sketch
- 2 - inspection
- 3, 4

