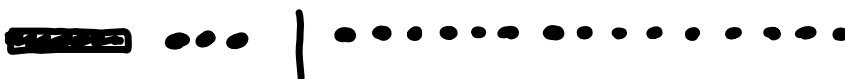Warm Up Grade 7

Write an equation and solve using tiles
a) a number increased by 3 is 15

add

$$n + 3 = 15$$

$$n + 3 = 15$$

zero

zero   zero

$$n + 3^{-3} = 15^{-3}$$

$$\boxed{n = 12}$$

Write an equation and solve using algebra
a) Four times a number decreased by 7 is 29

$$4n - 7 = 29$$

$$4n - 7^{+7} = 29^{+7}$$

$$4n = 36$$
$$\div 4 \qquad \div 4$$

$$\boxed{n = 9}$$

pg 235.

a) $n = $ score after 6

$n + 2 = +4$

$n + 2 - 2 = 4 - 2$

$n = 2$

b) $p = $ score after 12

$p + (-2) = +1$

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

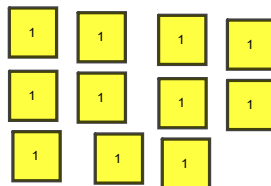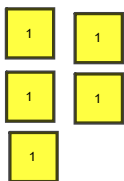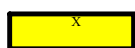$p = +3$

c) $r = $ score after 14

$r + (-4) = -2$

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

$r = +2$

$r - 4 = -2$

$r - 4 + 4 = -2 + 4$
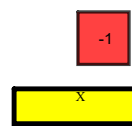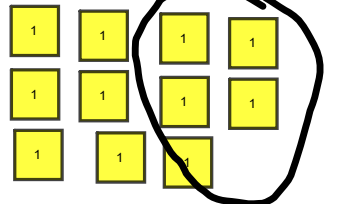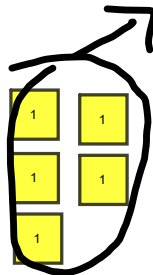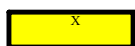
$r = +2$

Sheet - Extra Practice 3

1
a) $x + 5 = 11$
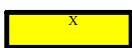
$x + 5 - 5 = 11 - 5$

$x = 6$
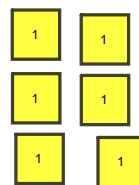
d) $x - 3 = 5$
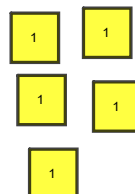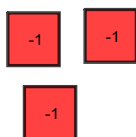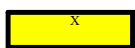
$x - 3 + 3 = 5 + 3$
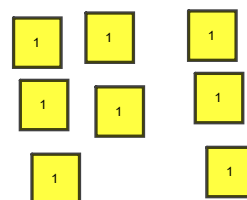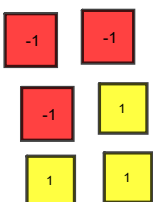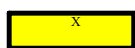
$x = 8$
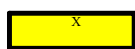
e) $x - 7 = 3$
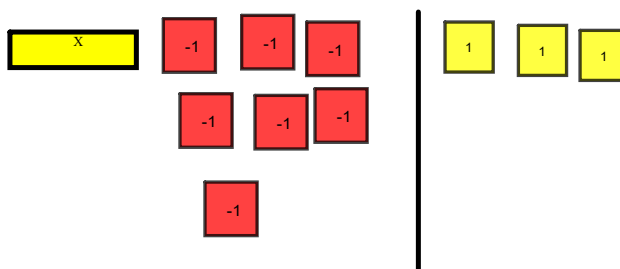
$x - 7 + 7 = 3 + 7$
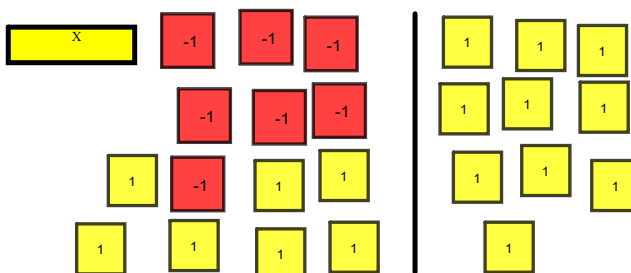
$x = 10$
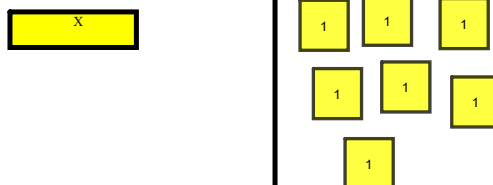
1 b) $4 + x = 9$

$4 + x - 4 = 9 - 4$

$x = 5$

c) $13 = x + 8$

$13 - 8 = x + 8 - 8$

$5 = x$

f) $11 = x - 2$

$11 + 2 = x - 2 + 2$

$13 = x$

2 - orally

2 a) $p - 7 = 9$

$p = 16$

b) $q + 8 = 27$

$q = 19$

c) $3 = k - 6$

$k = 9$

d) $s - 7 = -3$

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

$s = 4$

$s - 7^{+7} = -3^{+7}$

e) $x + 3 = -4$

$x + 3^{-3} = -4^{-3}$

$x = -7$

f) $x + 5 = 2$

$x = -3$

3a) $x =$ the number

$$x - 6 = 7$$
$$x - 6 + 6 = 7 + 6$$
$$x = 13$$

The number is 13.

b) $x =$ the number

$$x - 3 = -5$$
$$x - 3 + 3 = -5 + 3$$
$$x = -2$$

The number is -2.

4. $x =$ the number of student who stayed

$$x + 11 = 27$$
$$x + 11 - 11 = 27 - 11$$
$$x = 16$$

16 students stayed 2 hours.

5. $t =$ original temperature

a) $t - 6 = {}^-10$

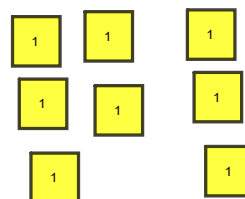$t - 6 + 6 = -10 + 6$

$t = {}^-4$

b) $t + 7 = {}^+2$

$t + 7 - 7 = 2 - 7$

$t = {}^-5$

c) $t - 8 = {}^-3$

$t - 8 + 8 = {}^-3 + 8$

$t = 5$

<u>**Solving Equations using Algebra**</u>

When we solve equations using algebra, the first thing we want to do is to "isolate" the variable. That is we want to get the variable by itself on one side of the equal sign.

To isolate the variable and solve the equation, we use opposite operations:

Addition   opposite ●——————►Subtraction
Subtraction   opposite ●——————► Addition
Multiplication   opposite●—————► Division
Division   opposite●—————► Multiplication

Remember whatever you do to one side of the equation you MUST do the other side.

Examples:
$2x + 4 = 20$

$2x + 4^{-4} = 20 - 4$

$2x = 16$

$\div 2 \qquad \div 2$

$\boxed{x = 8}$

Verify

LHS   RHS

$2x + 4$ 20

$2(8) + 4$

$16 + 4$

20 Same ✓

Your Turn

Solve using algebra

a) $4x - 3 = 13$

$4x - 3 {\color{green}+3} = 13 {\color{green}+3}$

$4x = {\color{red}16}$

${\color{green}\div 4} \qquad {\color{green}\div 4}$

$\boxed{{\color{blue}x = 4}}$

b) $3x + 8 = -1$

${\color{green}3x + 8} {\color{red}-8} = {\color{red}-1} {\color{red}-8}$

${\color{black}3x} = {\color{blue}(-9)}$

${\color{red}\div 3} \qquad {\color{red}\div 3}$

$\boxed{{\color{black}x = -3}}$

Your Turn

Solve using algebra

a) $4x - 3 = 13$

b) $3x + 8 = -1$

$$4x - 3 = 13$$
$$4x - 3 + 3 = 13 + 3$$
$$4x = 16$$
$$\frac{4x}{4} = \frac{16}{4}$$
$$x = 4$$

$$3x + 8 = -1$$
$$3x + 8 - 8 = -1 - 8$$
$$3x = -9$$
$$\frac{3x}{3} = \frac{-9}{3}$$
$$x = -3$$

verify

LS   RS
$4x - 3$ 13
$4 \times 4 - 3$
$16 - 3$
13

verify

LS   RS
$3x + 8$ -1
$3x - 3 + 8$
$-9 + 8$
-1

Class / Homework

Page 236

L

#1 to #4

don't draw just use algebra to solve all

Page 238

b
1 i) $x \equiv$ amount of water for each day

$3x + 8 = 29$

1 to #3

4 a) i) $x \equiv$ amount hiked on 2nd day

$5 + x = 12$

$5^{-5} + x = 12 - 5$

$\boxed{x = 7}$

She hiked 7km on the 2nd day.

4 i) $x \equiv$ distance on day 3 and day 4

$\underline{x} + \underline{x} = 12$

$2x = 12$
$\div 2 \qquad \div 2$

$\boxed{x = 6}$

She hiked 6 km each day.

1b) i) $x =$ # of squirds on 4th day

$\underline{67} + x = 92$