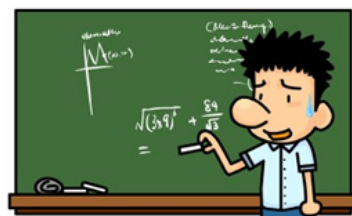**Warm Up Grade 7**

1) Write an equation for the following:

let $n \equiv$ a number

= equal

a) 7 more than triple a number is 28.

add 7   3 times "n"

$$3n + 7 = 28$$

b) Jake has 5 cookies. He has 6 less than Ryan. How many cookies does Ryan have?

let $r \equiv$ # of cookies Ryan has

$$r - 6 = 5$$

2) Evaluate the expression:

a) 2x -10   for x = 5   b) 7 + n   for n = -2

$$2(5) - 10$$
$$10 - 10$$
$$0$$

$$= 7 + (-2)$$
$$= (+5)$$

1. Write a sentence for each equation.
a) $n + 11 = 15$ **b)** $4n = 24$ **c)** $n/6 = 5$ **d)** $3n + 4 = 19$

a) $n + 11 = 15$
  The number of students increased
by 11 is 15

b) $4n = 24$
 4 times the hourly wage is 24

c) $\frac{n}{6} = 5$
A number divided by 6 equals 5

d) $3n + 4 = 19$
4 more than triple the number of
points is 5

2.

a) Two more than five times a number is 17.

$m =$ the number $2 + 5n = 17$ $5n + 2 = 17$

b) Shawn's age 9 years from now will be 23.

$s =$ Sean's age $s + 9 = 23$

c) The perimeter of a regular hexagon with side length s centimetres is 42 cm.

hexagon → 6 sides $6s = 42$

d) The cost of three boxes of popcorn at \$3 each, and two drinks at x dollars each is \$17.

$3 \times 3 + 2x = 17$ $9 + 2\,drink = 17$
$9 + 2x = 17$ popcorn + 2x
                         $2x + 9 = 17$

3.   Match each equation with the correct sentence.
   a) $n + 3 = 6$ A. A number divided by three equals six.
   b) $3n = 6$ B. The sum of a number and three is six.
   c)   n/3 = 6   C. The product of a number and three is six.
   d) $3n + 3 = 6$ D. Three more than three times a number is six.

a) B

b) C

c) $\frac{n}{3} = 6$ A

d) D

4.
a) Samantha has 16 CDs. She has 4 more CDs than Marlene.
How many CDs does Marlene have?

n = Marlene's CD's $n + 4 = 16$

b) If Juni doubles the number of comic books he has, he will have 14 comic books. How many comic books does Juni have?

n = number of comic books $2n = 14$

c) Five more than three times a number is 17.
What is the number?

n = the number $5 + 3n = 17$
                          $3n + 5 = 17$

d) In the game of Yonder, a player scores x points for a Pika and 3 points for a Grinner.
Samuel scored 20 points. He had 4 Grinners and 2 Pikas.
How many points is one Pika worth?

x = Pika points
$4 \times 3 + 2x = 20$
$12 + 2x = 20$

5. $2n + 3 = 15$
Two time the goals scored plus 3 is 15.

6. Angelica is thinking of a number. She multiplies it by 5 and then adds 7.
The result is 22. Write an equation to represent this situation.

n = the number $5n + 7 = 22$

Warm Up Grade 7

Write an equations and solve the following by inspection

a) The sum of a number and 15 is 21

add $n + 15 = 21$

b) 2x - 6 = 32

$38 - 6$

$2 \ (19)$

Use mental math.

1. 500 - 297

$500 - 300$

200

subtract 3 too many so add on

$= 203$

2. $\frac{1}{3} + \frac{4}{6}$

$\frac{2}{6} + \frac{4}{6}$

$\frac{6}{6}$

$= 1$

3. 25 x 17 x 4

$25 \times 4 \times 17$

100×17

1700

4. 0.2 x 43

0.2×43

8.6

Homework

pg 225

8. The side of regular octagon is 11 cm. What is the perimeter

p = perimeter of octagon

$$p = 11 \times 8$$
$$= 88$$

9. k = number of friend to get keychain

$$24k + 10 = 130$$

guess and test

k = 4

| $24k + 10$ |
| $24 \times 4 + 10$ |
| $96 + 10$ |
| 106 |

k = 5

| $24k + 10$ |
| $24 \times 5 + 10$ |
| $120 + 10$ |
| 130 |

(K = 5)

5 friends each got keychains

10 a) $3n = 27$
$$n = 9 \quad \text{(Insp)}$$

b) $2n + 3 = 27$
$$n = 12 \quad \text{(Insp)}$$

c) $2n - 3 = 27$
$$2 \times 15 - 3 = 27$$
$$n = 15 \quad \text{(Insp)}$$

d) $\dfrac{n}{3} = 27$

n = 99
$$\dfrac{n}{3}$$
$$\dfrac{99}{3}$$
$$33$$

n = 90
$$\dfrac{n}{3}$$
$$\dfrac{90}{3}$$
$$30$$

n = 81
$$\dfrac{n}{3}$$
$$\dfrac{81}{3}$$
$$27$$

(n = 81)

6

Sheet Extra Practice1

1 a) $5x = 65$

Equation

b) $y + 8$

Expression

c) $3a - 6$

Ex

d) $z + 3 = 9$

Eq

e) $\dfrac{p - 4}{2}$

Ex

f) $3g - 5 = 19$

Eq

If it has an equal sign, then it is an equation.

2a) $d + 9 = 23$

① $d = 15$ $d + 9$
           $15 + 9$
             24

② $d = 14$ $d + 9$
           $14 + 9$
$\boxed{d = 14}$ 23

b) $\dfrac{f}{4} = 6$

$\boxed{d = 24}$ $\dfrac{f}{4}$
          $\dfrac{24}{4} = 6$

c) $3c - 5 = 16$

$c = 6$ $3c - 5$
       $3 \times 6 - 5$
        $18 - 5$
          13

$c = 7$ $3c - 5$
        $3 \times 7 - 5$
         $21 - 5$
$\boxed{c = 7}$ 16

d) $2x + 3 = 17$

$x = 8$ $2x + 3$
      $2 \times 8 + 3$
       $16 + 3$
         19

$x = 7$ $2x + 3$
       $2 \times 7 + 3$
        $14 + 3$
$\boxed{x = 7}$ 17

e) $4y = 52$

$y = 12$ $4y$
       4×12
         48

$y = 13$ $4y$
        4×13
$\boxed{y = 13}$ 52

f) $2e + 7 = 31$

$e = 14$ $2e + 7$
       $2 \times 14 + 7$
       $28 + 7$
         35

$e = 12$ $2e + 7$
       $2 \times 12 + 7$
       $24 + 7$
$\boxed{e = 12}$ 31

3a) $5a = 35$

$a = 7$

b) $x + 7 = 13$

$x = 6$

c) $p - 8 = 15$

$p = 23$

d) $2z - 3 = 13$

$z = 8$

e) $3d + 7 = 19$

$d = 4$

f) $4c - 1 = 19$

$c = 5$

4. a) $n =$ hockey cards at beginning

$n - 15 = 37$

$n = 50, \quad n - 15$

$50 - 15$

35

$n = 52, \quad n - 15$

$52 - 15$

$n = 52 \quad 37$

He started with 52 cards

b) $d =$ cost of each DVD

$15d = 255$

$d = 10, \quad 15d$

15×10

150

$d = 15, \quad 15d$

15×15

225

$d = 17 \quad 15d$

15×17

255

She paid $17 for each DVD

c) $d =$ number of friends

$5d = 35$

$d = 7$

7 friends were given candies

5. $n =$ the number

a) $n + 6 = 17$

$n = 11$

b) $n - 5 = 23$

$n = 28$

c) $3n = 18$

$n = 6$

d) $\dfrac{n}{4} = 8$

$n = 32$

e) $3n + 2 = 17$

$n = 5$

f) $2n - 5 = 9$

$n = 7$

6. $p =$ number of puzzles for each friend

$8p + 9 = 57$

$p = 5$ $8p + 9$ $p = 6$, $8p + 9$

         $8 \times 5 + 9$ $8 \times 6 + 9$

         $40 + 9$ $48 + 9$

          49 $p = 6$ 57

Each friend gets 6 puzzles

BEFORE   **Get Started**

Review the balance scales at the top of page 226 of the Student Book.

Show a balance scales with these masses:

6g
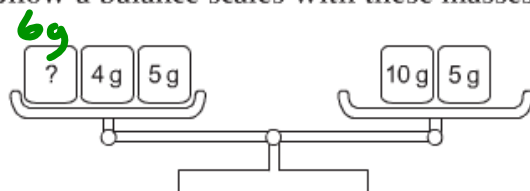
Ask:

- What happens if I remove the 5-g mass from the left pan? (*The balance tips to the right.*) Why? (*Because the mass in the right pan is greater than the mass in the left pan.*)
- What happens if, instead, I remove a 5-g mass from each pan? (*The balance does not move.*) Why? (*Because you removed the same mass from each pan to keep the balance.*)
- What does this mean? (*The masses in the two pans are equal. The unknown mass plus the 4-g mass are balanced by the 10-g mass.*)

Balance Model

MUST keep the scales BALANCED (which means equal)

Write an equation for each scale then solve

$$14 \quad = \quad 10 + x$$

a) $\underline{\quad 7 \text{ x } 2 \quad}$ $\underline{\quad 8 + 2 + x \quad}$

$10 + x = 14$

$\cancel{10}^{-10} + x = 14 - 10$

$x = 4$

in the scale what do I have to do to get the variable all by itself

b) $\underline{\quad 4 + 3 - 9 \quad}$ $\underline{\quad 6 - 4 - k \quad}$

$$-2^{+K} = 2 - K^{+K}$$

$$K - 2^{+2} = 2^{+2}$$

$$\boxed{K = 4}$$

c) $\underline{\quad 18 \div 3 \quad}$ $\underline{\quad m + m + m \quad}$

$$3m = 6$$
$$\div 3 \qquad \div 3$$

$$\boxed{m = 2}$$

Here is a balance-scales model.
Mass A is an unknown mass.
Find the mass of A. Verify the solution.

$$A + 7 = 25$$

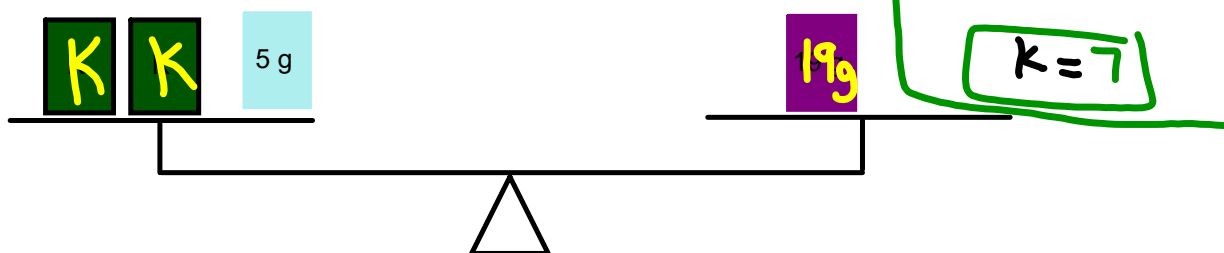$$A + 7 - 7 = 25 - 7$$

$$\boxed{A = 18}$$
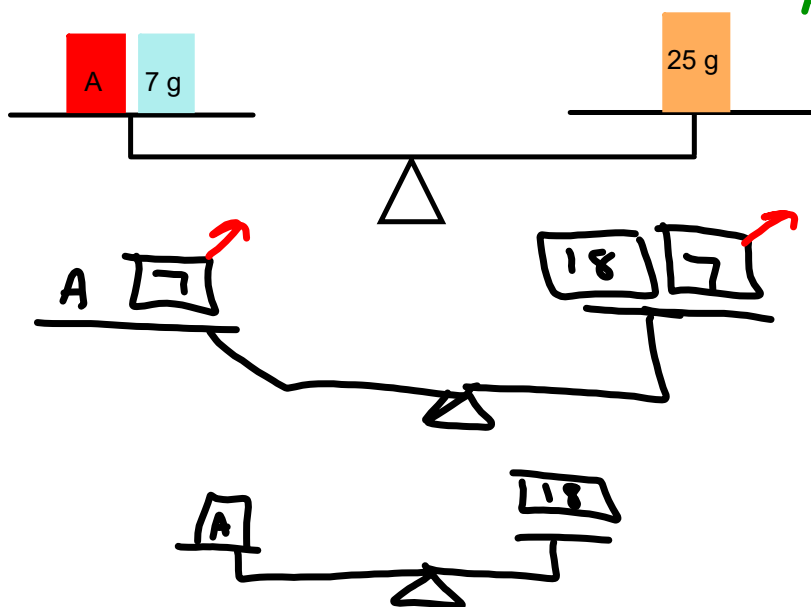
Here is a balance-scales model.
Mass K is an unknown mass.
Find the mass of K. Verify the solution.

$$2k + 5 = 19$$

$$2k + 5 - 5 = 19 - 5$$

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

$$k = 7$$

K   K   5 g

19 g

Solving equations requires that the balance of the equation is maintained so that the expressions on either side of the equal sign continue to represent the same quantity.

<u>To KEEP balance and equality:</u>

- We can add the same quantity (mass) to each side.

- We can subtract the same quantity (mass) to each side. use arrow pointing away for balances

- We can divide each side into the same number of equal groups.

Sketch balance scales to represent the equation.
Solve the equation. Verify the solution.

$3n + 1 = 7$

$3n + \cancel{1} = 7 - 1$

$\dfrac{3n}{3} = \dfrac{6}{3}$

$n = 2$

Draw a balance and solve:

Your Turn

show work using algebra
a+6=24

Do we really need to how work using balance? No Just remember what you do to one side you must do to the other.

$$a + 6 - 6 = 24 - 6$$

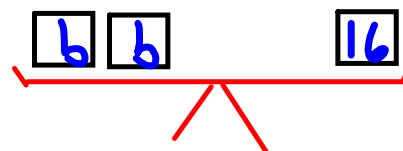$$\boxed{a = 18}$$
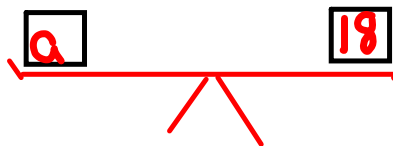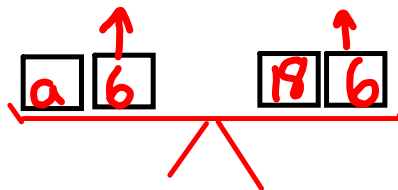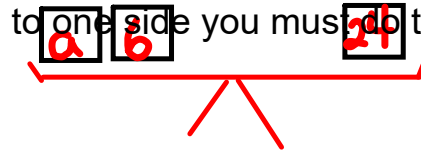
Ex 2)

$$2b = 16$$

$$\div 2 \qquad \div 2$$

$$\boxed{b = 8}$$
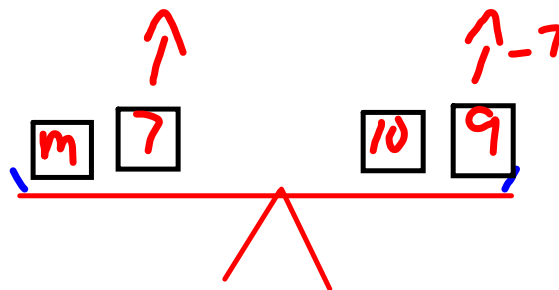
Class/Homework

use Algebra

Sheet Extra Practice 2

#1 -Sketch and solve part i to iv

Solve part v to viii

#2 , #3, #4, #5

Solve by either drawing or showing algebraic steps

Attachments

Extra Practice 2 Solving Equations by balancing pdf.pdf