Foundations of Math
Chapter 1 - Part 3

Name:

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REARRANGING FORMULAS

1.) Solve each equation for x. For part (c), remember a variable symbol, like a, b, and c, represents a number.

    a. $2x - 6 = 10$ b. $-3x - 3 = -12$ c. $ax - b = c$

2.) Compare your work in parts (a) through (c) above. Did you have to do anything differently to solve for x in part (c)?

3.) Solve the equation $ax - b = c$ for a. The variable symbols x, b, and c represent numbers.

REMEMBER- WHAT IT MEANS TO SOLVE EQUATIONS:

- To solve an equation for x means to get x _____ on one side of the equation.

- (x = _____)

- To solve an equation for y means to get y _____ on one side of the equation.

- (y = _____)

- Therefore, to solve for any variable is to _____

EXAMPLES:

1) Solve for *x*: $ax + b = c$

2) Solve for *h*: $A = \frac{1}{2}bh$

3) Solve for *F*: $S = 3F - 24$

4) Solve for *g*: $M = \frac{t+g}{3}$

5) Solve for *L*: $P = 2(L + W)$

6) Solve for *S*: $A = \frac{\pi r^2 S}{360}$

Rearranging formulas day 2

Rearranging formulas is the same thing as solving an equation, but with no numbers.

Solve for the indicated variable in the parenthesis.

1) $P = IRT$ *(T)*

2) $y = 5x - 6$ *(x)*

3) $\dfrac{x+y}{3} = 5$ *(x)*

4) $ax + by = c$ *(y)*

5) $V = LWH$ *(L)*

6) $V = \pi r^2 h$ *(h)*

7) $\quad x = \dfrac{yz}{6} \quad$ (z)

8) $\quad ax + 3b = 2f \quad$ (b)

9) $\dfrac{x+b}{4} = c \quad$ (x)

10) $\quad \dfrac{x}{5} - 7 = 2q \quad$ (x)

ratios and proportions

A _____ is a _____ between two different things.

Example 1:

of boys in here: _____   # of girls in here: _____

Ratio of boys to girls:_____   Ratio of girls to boys:_____

Ratio of boys to girls:_____   Ratio of girls to boys:_____

Ratio of boys to girls:_____   Ratio of girls to boys:_____

Example 2:

- There are 10 caramel candies and 15 chocolate candies. Find the ratio of chocolate to caramel.

- There are thirty-five people, fifteen of whom are men. Find the ratio of men to women.

*An equation that states that two _____ are equal is called a _____.

If a proportion is true, when you _____, you should get both sides to equal each other.   In general form, this looks like:

$$\frac{a}{b} = \frac{c}{d}, \ so \ \underline{\hspace{8cm}}$$

Are the following true proportions?? Yes or No?

a. $\frac{1}{2} = \frac{16}{32}$ _____   **b.** $\frac{5}{8} = \frac{10}{15}$ _____   **c.** $\frac{10}{20} = \frac{25}{49}$ _____

SOLVING PROPORTIONS

If a proportion involves a _____, you can use
_____ to solve the proportion.

Examples:

1) Solve $\dfrac{a}{16} = \dfrac{6}{4}$

2) Solve $\dfrac{5}{b+1} = \dfrac{30}{54}$

3) Solve $-\dfrac{5}{11} = -\dfrac{35}{d}$

4) Solve $\dfrac{e}{-6} = -\dfrac{5}{8}$

5) Solve $\dfrac{3}{12} = \dfrac{2}{f+6}$

6) Jose finished 50 math problems in 2 hours. At this rate, how many hours will it take him to complete 75 problems?	**7)** The Maritime Flag Football team outscored its opponents 5:2 last season. If their opponents scored 38 points, how many points did Maritime score?

Verbal Phrases for each Operation

Addition	Subtraction

Multiplication	Division

Inequality/Equation Phrases

Greater Than >	Less Than <

Greater Than or Equal To ≥	Less Than or Equal To ≤

Equal To

writing expressions
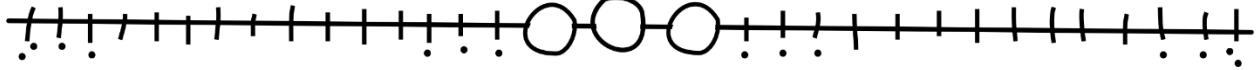
Write an expression for each of the sentences below:

Remember: If something is unknown, we can use a variable to represent it.

1) 8 more than a number

4) A number decreased by 1

2) The difference of 4 and a number

5) The product of 9 and b

3) 10 less than 5 times a number

6) 6 times the difference of a and 9

Phrases indicating equations and inequalities:

1) Amy can spend at most $20 (*d represents dollars*)	**2)** I have more than 5 hats (*h represents hats*)
3) She must study at least 2 hours (*h represents hours*)	**4)** He has less than 4 missing assignments (*a represents assignments*)
5) No more than 8 students can sit at the lunch table. (*s represents students*)	**6)** Kel has 7 bottles of orange soda. (*b represents bottles*)

We can also interpret word problems to set up and solve.

First, set up each problem. Then solve.

1) The sum of a number and 9 is 17.

2) 3 fewer than a number is no more than 25

3) The difference of a number and 18 is 12

4) 3 times a number is at least 27

5) 12 divided by a number is less than 6

6) The quotient of 30 and a number increased by 12 is 2

7) The quotient of 30 and a number, increased by 12 is 22

CONSECUTIVE INTEGERS

_____   _____
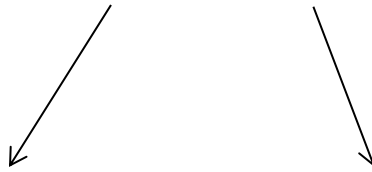
Give an example of 5 consecutive integers:

How do we get from one consecutive integer to the next?

Examples:

1) The sum of two consecutive integers is 43. Find the integers.

2) The sum of _three_ consecutive integers is 54.   Find the integers.

Consecutive Integer Word Problems always follow this setup:

1st # = n

2nd # = n+1

3rd # = n+2 … and so on

3) The sum of three consecutive integers is -177. Find the integers.

4) Find three consecutive integers such that their sum is 0.

5) Find two consecutive integers such that the sum of the smaller integer and twice the larger integer is 59.

even and Odd consecutive IntegeRs
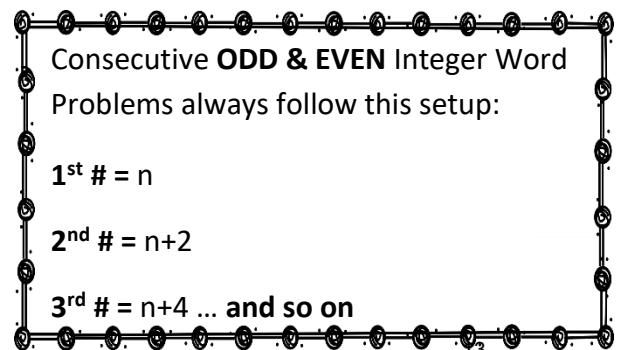
Give an example of 5 consecutive even integers: How do we get from one consecutive even integer to the next?	Give an example of 5 consecutive odd integers: How do we get from one odd consecutive integer to the next?

we solve even and Odd consecutive IntegeRs pRoblems in the same exact way!

Examples:

1) Find two consecutive even integers whose sum is 90.

2) Find three consecutive even integers whose sum is -144

Consecutive **ODD & EVEN** Integer Word Problems always follow this setup:

1st # = n

2nd # = n+2

3rd # = n+4 ... **and so on**

3) Find *four* consecutive even integers whose sum is 116.

4) Find three consecutive odd integers whose sum is 99

5) Find four consecutive odd integers whose sum is 8.

Translating Consecutive Integers

1) Find three consecutive integers such that the sum of the smallest and the largest is 82.

2) Find four consecutive integers such that the sum of the second and the fourth is 132.

3) Find two consecutive even integers such that twice the smaller is 28 more than the larger.

4) Find two consecutive even integers such that twice the smaller exceeds the larger by 28.

5) Find two consecutive odd integers such that 4 times the larger is 29 more than 3 times the smaller.

6) Find three consecutive even integers such that the sum of the smallest and twice the second is 20 more than the third.

7) Find two consecutive odd integers such that 5 times the larger exceeds 4 times the smaller by 31.

8) Find four consecutive even integers such that the sum of the first three exceeds the largest by 36.

9) Find four consecutive integers such that three times the largest decreased by 10 exceeds twice the smallest by 40.

Perimeter Word Problems Day 1

Define variables and write expressions for the following statements.

1) The length is 8 more than the width.

3) The length is three more than twice the width.

2) The width is one half of the length.

4) The tail of the kite is 1.5 ft. plus twice the length of the kite.

5) The side of an isosceles triangle is 3 less than twice the base.

Solve the following word problems using let statements.

1) The length of a rectangle is 8 in. more than its width. The perimeter of the rectangle is 24 in. What are the width and the length of a rectangle?

2) The width of a rectangle is one half of its length. The perimeter of the rectangle is 54 cm. What are the width and length of the rectangle?

3) The length of a rectangular garden is 3 yd. more than twice its width. The perimeter of the rectangle is 36 yd. What are the width and the length of the garden?

4) The side of an isosceles triangle is 3 less than twice the base. The perimeter of the triangle is 49 in.

Perimeter Day 2

Find the given dimensions of each figure:

1) Find the length of a rectangular lot with a perimeter of 50 feet if the length is five feet more than the width.

2) An isosceles triangle has a base that is four more than twice a side. The perimeter is 16. Find the dimensions.

3) Find the length of a rectangular lot with a perimeter of 594 feet if the length is three feet less than twice the width.

4) Find the width of a rectangular piece of property that has a perimeter of 610 feet if the length is twenty feet more than two times the width.

5) Find the length of a rectangular building with a perimeter of 110 meters if the length is four times the width.

6) Find the dimensions of a rectangle if the perimeter is 318 inches and the length is half the width plus 9 inches.

7) Find the width of a rectangular wall if the perimeter is 148 feet and the width is two more than seven times the length.

8)   a. If the width (w) is 10, find the perimeter of this rectangle:

b. Describe the length in terms of the width:

2w+3

w   w

2w+3
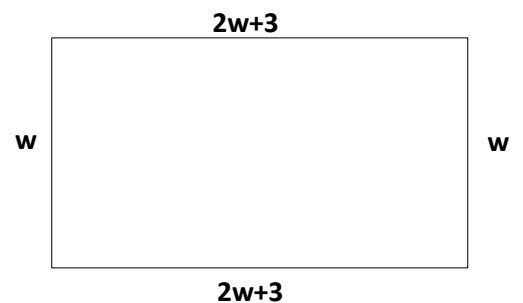
In the table below, fill in the value of the number of dimes given. Look for a pattern.

Number of Dimes	Value	Pattern (how did you find it?)
1	$0.10	$1 \times \$0.10 = \$0.10$
2		
3		
5		
10		
20		
35		
d		
n+3		

How do we find the dollar value of any number of dimes?

Coin Word Problems

How much are they worth?

Coin	Cents	Dollars

When we are solving these problems, we will be converting the values into _____ to solve.

We will always set up _____ to solve coin problems.

1) Davion has $1.15 in nickels and dimes. If he has 9 dimes, how many nickels does he have?

2) William has $2.35 in quarters and dimes. If he has 6 dimes, how many quarters does he have?

3) Diona has $3.65 in nickels and dimes. She has 13 more nickels than dimes. How many of each coin does she have?

4) Jayden had three times as many nickels as dimes. If the total value of his coins was $1, how many of each kind of coin did he have?

5) Amani has $2.45 in nickels and dimes. She has ten more nickels than dimes. How many of each does she have?

6) Timone had 7 more than two times as many quarters as dimes. If the total value of his coins was $10.15, how many of each kind of coin did he have?

7) Andre has 3 less than twice as many dimes than nickels. If the total value of his coins is $0.95, how many of each kind of coin did she have?

Coin Word Problems

1) Amiyah has 4 less than three times as many dimes than nickels. If she has $1.35, how many of each coin does she have?

2) Candace has 4 more quarters than nickels. If her coins total to $2.80, how many of each coin does she have?

Review with Word Problems

1) Translate and solve: Three less than 5 times a number is no more than 12

2) Find three consecutive even integers such that their sum is 240.

3) Find three consecutive integers such that twice the larger exceeds the smaller by 40.

4) A rectangular garden has a perimeter of 104 ft. and has a length that is 4 more than twice the width. Find the dimensions of the garden. Find the length and width.

5) The second side of a triangle is 8 inches less than the first side. The third side is 14 inches more than the first side. The perimeter of the triangle is 63 inches. Find each side of the triangle.

1.) The perimeter of a rectangle is 24 inches. Find the dimensions if its length is 3 inches greater than its width.

2.) The sides of an isosceles triangle are 8 inches less than twice the base. The perimeter of the triangle is 74 in. What is the length of the base?

3.) Find 4 consecutive odd integers such that their sum is 200

4.) Find 3 consecutive even integers such that the sum of the first and the third integer is -20.

5.) Find 3 consecutive integers such that 3 less than twice the larger exceeds the smaller by 11.

Consecutive Integers- Translating

1. Find three consecutive integers such that the sum of the first and third is 40.

2. Find two consecutive even integers such that twice the smaller is 26 less than 3 times the larger.

3. Find three consecutive integers such that twice the smallest is 12 more than the largest.

4. Find three consecutive integers such that the sum of the first two is 24 more than the third.

5. Find two consecutive integers such that 4 times the larger exceeds 3 times the smaller by 23.

6. Find four consecutive odd integers such that the sum of the first three exceeds the fourth by 18.

Consecutive Even and Odd Integers

1. Find three consecutive even numbers whose sum is -42

2. Find four consecutive even numbers whose sum is 68.

3. Find three consecutive odd numbers whose sum is 33.

4. Find four consecutive odd numbers whose sum is 232.

Consecutive Integers

1. Find two consecutive integers whose sum is 91.

2. Find three consecutive integers whose sum is -18.

3. Find four consecutive integers whose sum is 110.

Write an equation or inequality for each word problem, and then solve it.

1.) Ten times a number, increased by 9 is 59.

5.) 5 times the difference of 8 and x is at least 15.

2.) Ten times a number increased by 9 is 100.

6.) The quotient of 4 times a number and 2 is fewer than 16.

3.) Six times a number decreased by 4 is no more than 68.

7.) One half of a number is 8.

4.) Six times a number, decreased by 4 is no more than 68.

8.) 3 less than a number divided by 4 is at least 8.

Name:_____

Solve each of the following proportions.

1.) $\dfrac{g}{5} = \dfrac{6}{10}$

2.) $\dfrac{z}{4} = \dfrac{7}{8}$

3.) $-\dfrac{2}{3} = -\dfrac{10}{t}$

4.) $\dfrac{3}{6} = \dfrac{x-3}{8}$

5.) You are riding your bicycle. It takes you 32 min to go 8 mi. If you continue traveling at the same rate, how long will it take you to go 15 mi?

6.) A canary's heart beats 130 times in 10 s. Use a proportion to find how many times its heart beats in 50 s.

Name: _____

Rearranging Formulas

1. Solve for p: $2m + 2p = 16$

_____

2. Solve for x: $bx - 2 = K$

_____

3. Solve for m: $c = 2m + d$

_____

***must show work for this problem to get credit

4. Which equation is equivalent to $3x + 4y = 15$?

   [A] $y = 15 - 3x$

   [B] $y = \dfrac{15 - 3x}{4}$

   [C] $y = 3x - 15$

   [D] $y = \dfrac{15 + 3x}{4}$