



*A Tradition of Excellence*

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Dear Seventh Grader,

Attached is your summer math packet. containing several of the topics that we worked on during this school year. In order for you to come back in September prepared to begin eighth grade, we are asking that you work hard on completing this packet.

Please do not limit yourself to this work alone. Because numbers play an integral role in our everyday life, be aware of the many ways you experience math daily. Also, on the internet, there are a wide variety of good sites for middle school level math review. Take advantage of them.

We have truly enjoyed teaching you and watching you grow academically, spiritually and physically, and look forward to working with you in eighth grade.

Have a wonderful summer,  
Mrs. Chadwick  
Mrs. Forsyth

Name \_\_\_\_\_

Solve the problems and put your answers on the answer sheet.

I.) **FRACTIONS**

A.) **Reduce to simplest form.**

1.)  $\frac{3}{9}$

2.)  $\frac{4}{10}$

3.)  $\frac{24}{32}$

B.) **Change to improper fractions.**

4.)  $2\frac{3}{8}$

5.)  $3\frac{6}{7}$

6.)  $7\frac{3}{4}$

C.) **Change to mixed numbers.**

7.)  $\frac{7}{3}$

8.)  $\frac{21}{9}$

9.)  $\frac{42}{16}$

D.) **Adding fractions.**

10.)  $2\frac{7}{10} + 8\frac{1}{2}$

11.)  $\frac{1}{7} + \frac{3}{14}$

12.)  $3\frac{2}{3} + 2\frac{2}{5} + 4\frac{5}{6}$

E.) **Subtract fractions.**

13.)  $5\frac{5}{12} - 2\frac{7}{8} =$

14.)  $8\frac{2}{3} - 1\frac{2}{9} =$

15.)  $6\frac{1}{3} - 2\frac{2}{3} =$

F.) **Multiply fractions**

16.)  $\frac{2}{3} \times 9 =$

17.)  $1\frac{1}{8} \times 5\frac{1}{2} =$

18.)  $\frac{4}{8} \times \frac{3}{5} \times \frac{1}{2} =$

G.) **Division of fractions**

19.)  $2\frac{7}{8} \div \frac{1}{2} =$

20.)  $2\frac{2}{5} \div 2\frac{1}{3} =$

21.)  $4\frac{1}{6} \div 5 =$

H.) **Working with decimals. Computation**

22.)  $316.4 + 12.12 + 3.44 + .008 =$

23.)  $\$72.54 - \$12.69 =$

24.)  $31.2 \times 456 =$

25.)  $61 \overline{)170.8}$

I.) Write as a decimal.

26.)  $\frac{7}{10}$

27.)  $\frac{1}{3}$

28.)  $8\frac{1}{4}$

J.) Write as a percent.

29.)  $\frac{4}{5}$

30.)  $1\frac{2}{5}$

31.)  $\frac{2}{3}$

K.) Write as a decimal.

32.) 51%

33.) 102%

34.)  $\frac{3}{4}\%$

L.) Write as a fraction in lowest terms.

35.) 125%

36.) 3%

37.) 50%

M.) Write as a percent AND as a fraction or mixed number.

38.) .25

39.) 1.2

40.) .125

N.) Solve these percent problems.

41.) What number is 15% of 60?

42.) 66 is 11% of what number?

43.) 308 is what percent of 350?

44.) The price of milk increased from \$1.89 a gallon to \$2.09 a gallon. What was the percent of increase?

45.) A \$150 leather jacket is going on sale for a 25% discount. How much will the jacket cost on sale?

46.) Jim bought 3 CD's at a cost of \$14.99 each. What will he pay including 6% sales tax?

O.) Integers

47.)  $-4 + (-5)$

48.)  $-3 + (-8) + 12$

49.)  $7 - 14$

50.)  $13-7-15$

51.)  $-(-26)$

52.)  $(8)(-6)(-1)$

53.)  $165 \div (-5)$

54.)  $-150 \div (-6)$

**P.) Equations**

55.)  $x+2=5$

56.)  $x-2=3$

57.)  $3x=15$

58.)  $\frac{x}{2}=7$

59.)  $3x+7=28$

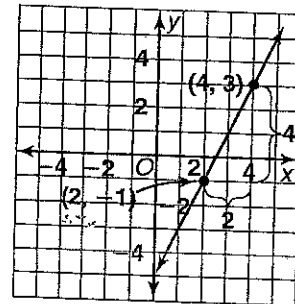
60.)  $4x-8=40$

# Review 227

## Understanding Slope

The slope of a line is  $\frac{\text{change in } y}{\text{change in } x}$  found by using two points on the line.

Find the slope of the line that passes through these two points: (4, 3) and (2, -1).



- To find the change in  $y$ , subtract one  $y$ -coordinate from the other:  
 $(3 - (-1)) = 4$ .
- To find the change in  $x$ , subtract one  $x$ -coordinate from the other:  
 $(4 - 2) = 2$ .

When you find the slope of a line, the  $y$ -coordinate you use first for the rise must belong to the same point as the  $x$ -coordinate you use for the run.

The slope of the line is:  $\frac{\text{change in } y}{\text{change in } x} = \frac{3 - (-1)}{4 - 2} = \frac{4}{2} = 2$

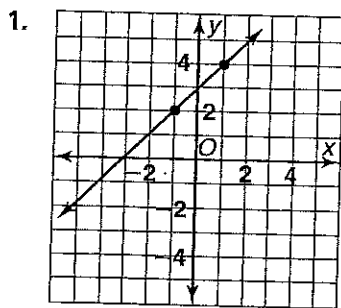
A table of values from the graph also shows the slope.

	-1 change in $x$				
$x$	5	4	3	2	1
$y$	5	3	1	-1	-3
	-2 change in $y$				

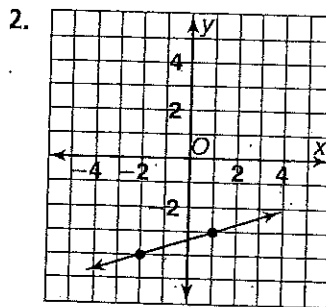
Compare the change in each coordinate.

$$\frac{\text{change in } y}{\text{change in } x} = \frac{-2}{-1} = 2$$

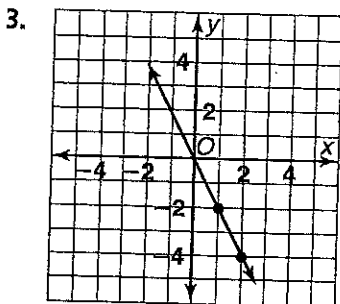
Find the slope of each line.



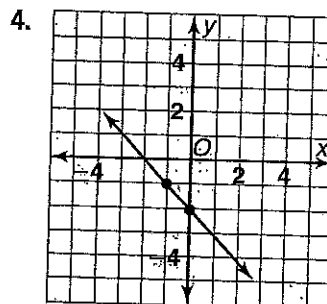
slope = \_\_\_\_\_



slope = \_\_\_\_\_



slope = \_\_\_\_\_



slope = \_\_\_\_\_

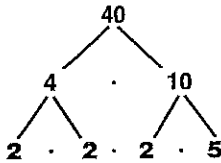
# Review 235

Factors

A *prime number* is a number with only two factors, 1 and itself.

The number 17 is prime.  
Its only factors are 1 and 17.

Use a factor tree to find prime factors.  
The product of prime factors is called the *prime factorization*.

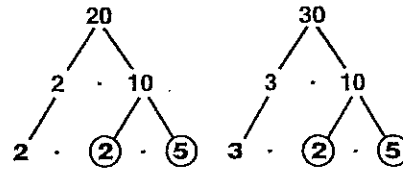


The prime factorization of 40 is  $2 \cdot 2 \cdot 2 \cdot 5$  or  $2^3 \cdot 5$ .

The *greatest common factor (GCF)* of a set of numbers is the greatest factor common to the numbers.

Find the GCF of 20 and 30.

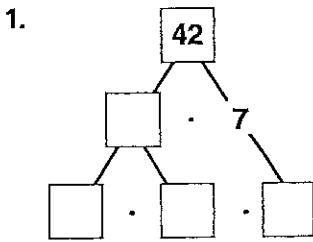
- ① Use factor trees to find prime factors.
- ② Circle the common factors. The product of the common factors is the GCF.



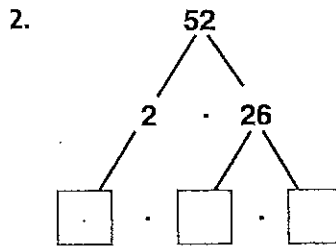
$2 \cdot 5 = 10$

The GCF of 20 and 30 is 10.

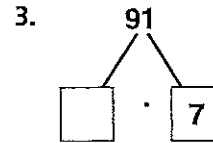
Complete these factor trees. Write the prime factorization for each number.



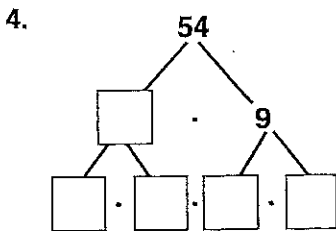
42 = \_\_\_\_\_



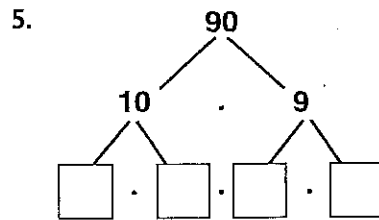
52 = \_\_\_\_\_



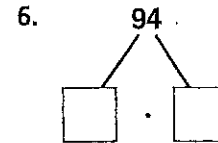
91 = \_\_\_\_\_



54 = \_\_\_\_\_



90 = \_\_\_\_\_



94 = \_\_\_\_\_

Find the GCF by finding the prime factorization.

7. 10, 12

\_\_\_\_\_

8. 15, 8

\_\_\_\_\_

9. 24, 30

\_\_\_\_\_

10. 12, 18

\_\_\_\_\_

11. 27, 18

\_\_\_\_\_

12. 20, 15

\_\_\_\_\_

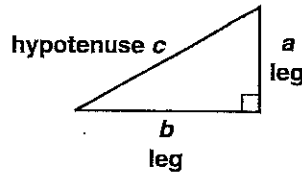
# Review 243

## The Pythagorean Theorem

### The Pythagorean Theorem

The sum of the squares of the lengths of the *legs* of a right triangle is equal to the square of the length of the *hypotenuse*.

Also, if  $a^2 + b^2 = c^2$ , then the triangle is a right triangle.



$$a^2 + b^2 = c^2$$

**Example 1:** Find the length of a leg of a right triangle if the length of the other leg is 12 cm and the length of the hypotenuse is 13 cm.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 12^2 + b^2 &= 13^2 \\ 144 + b^2 &= 169 \\ 144 - 144 + b^2 &= 169 - 144 \\ b^2 &= 25 \\ b &= \sqrt{25} \\ b &= 5 \end{aligned}$$

The length of the leg is 5 cm.

**Example 2:** Is a triangle with sides 6 m, 7 m, and 10 m a right triangle?

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 6^2 + 7^2 &\stackrel{?}{=} 10^2 && \leftarrow \text{Substitute.} \\ 36 + 49 &\stackrel{?}{=} 100 && \leftarrow \text{Simplify.} \\ 85 &\neq 100 \end{aligned}$$

The triangle is *not* a right triangle.

The lengths of two sides of a right triangle are given. Find the length of the third side.

1. legs: 6 ft and 8 ft  
hypotenuse:

\_\_\_\_\_

2. leg: 15 m  
hypotenuse: 17 m  
leg:

\_\_\_\_\_

3. leg: 12 in.  
hypotenuse: 15 in.  
leg:

\_\_\_\_\_

4. leg: 1.5 km  
hypotenuse: 2.5 km  
leg:

\_\_\_\_\_

5. legs: 15 in. and 20 in.  
hypotenuse:

\_\_\_\_\_

6. leg: 16 m  
hypotenuse: 34 m  
leg:

\_\_\_\_\_

Is a triangle with the given side lengths a right triangle?

7. 10 cm, 24 cm, 26 cm

\_\_\_\_\_

8. 5 ft, 7 ft, 9 ft

\_\_\_\_\_

9. 6 m, 12 m, 15 m

\_\_\_\_\_

10. 5 in., 12 in., 13 in.

\_\_\_\_\_

11. 30 mm, 40 mm, 50 mm

\_\_\_\_\_

12. 2 yd, 5 yd, 8 yd

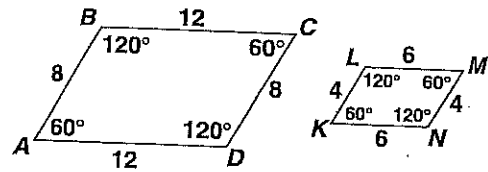
\_\_\_\_\_

# Review 248

## Similar Figures and Proportions

Similar polygons have congruent corresponding angles and corresponding sides that are in proportion. The symbol  $\sim$  means *is similar to*.

*Example:* Is parallelogram  $ABCD \sim$  parallelogram  $KLMN$ ?



- ① Check corresponding angles.
- ② Compare corresponding sides.

$$\angle A \cong \angle K, \angle B \cong \angle L, \angle C \cong \angle M, \text{ and } \angle D \cong \angle N$$

$$\frac{AB}{KL} = \frac{8}{6} = \frac{4}{3} \quad \frac{BC}{LM} = \frac{12}{4} = 3$$

$$\frac{CD}{MN} = \frac{8}{6} = \frac{4}{3} \quad \frac{DA}{NK} = \frac{12}{4} = 3$$

Corresponding angles are congruent. Corresponding sides are in proportion. The parallelograms are similar.

You can use proportions to find unknown lengths in similar figures.

- ① To find  $EF$ , use a proportion.
- ② Substitute.
- ③ Use cross products.
- ④ Solve.

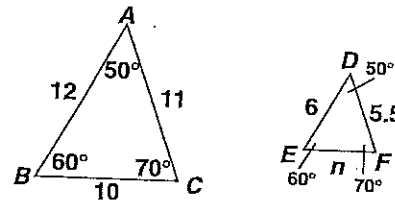
$$\frac{AB}{DE} = \frac{BC}{EF} \quad \triangle ABC \sim \triangle DEF$$

$$\frac{12}{6} = \frac{10}{n}$$

$$12n = 60$$

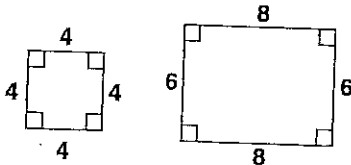
$$n = 5$$

$$EF = 5$$

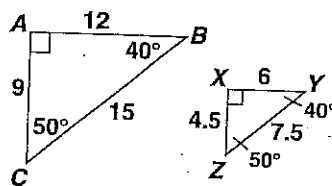


Tell whether each pair of polygons is similar. Explain why or why not.

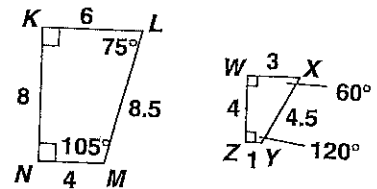
1.



2.

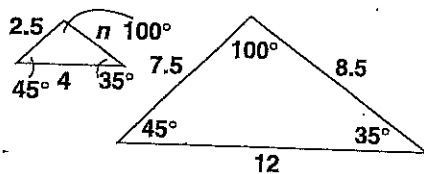


3.

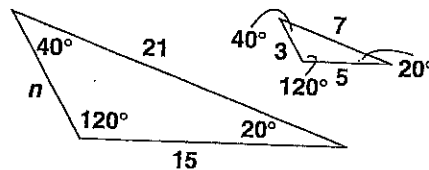


Exercises 4–6 show pairs of similar polygons. Find the unknown length.

4.



5.



6.

