

Name: \_\_\_\_\_

# Geometry Unit 1 Exam Review

## (Chapters P, 1, 2, and 3)

### Lesson 1-1

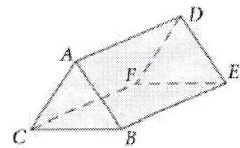
Find the next two terms in each sequence.

1. 12, 17, 22, 27, 32, ... *37, 42*      2. 1, 1.1, 1.11, 1.111, 1.1111, ... *1.11111, 1.111111*  
 3. 5000, 1000, 200, 40, ... *8, 5/8*      4. 1, 12, 123, 1234, ... *12,345, 123,456*  
 5. 3, 0.3, 0.03, 0.003, ... *0.0003, 0.00003*      6. 1, 4, 9, 16, 25, ... *36, 49*

### Lessons 1-3 and 1-4

Write true or false.

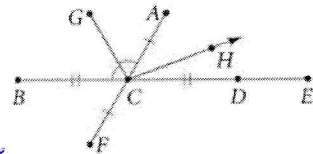
18.  $A, D, F$  are coplanar. *T*      19.  $\overleftrightarrow{AC}$  and  $\overleftrightarrow{FE}$  are coplanar. *F*  
 20.  $A, B, E$  are coplanar. *T*      21.  $D, A, B, E$  are coplanar. *T*  
 22.  $\overleftrightarrow{FC} \parallel \overleftrightarrow{EF}$  *F*      23. plane  $ABC \parallel$  plane  $FDE$  *T*  
 24.  $\overleftrightarrow{BC}$  and  $\overleftrightarrow{DF}$  are skew lines. *T*      25.  $\overleftrightarrow{AD}$  and  $\overleftrightarrow{EB}$  are skew lines. *F*  
 26.  $\overleftrightarrow{DE} \parallel \overleftrightarrow{CF}$  *F*      27.  $D, E,$  and  $B$  are collinear. *F*



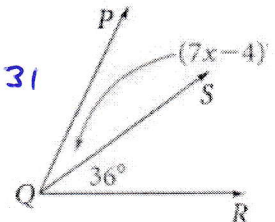
28. What is the intersection of plane  $ABC$  and plane  $FAD$ ?  *$\overleftrightarrow{AC}$*   
 29. Two lines that intersect always intersect in a *point*.  
 30. Two planes that intersect always intersect in a *line*.  
 31. How are parallel lines different than skew lines? *parallel lines are coplanar, skew are not*

### Lessons 1-5 and 1-6

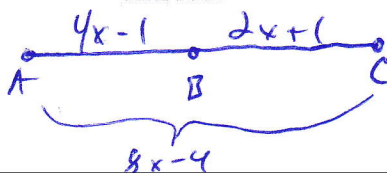
32. Name the ray opposite ray  $CD$ .  *$\overleftrightarrow{CB}$*   
 34.  $m\angle BCG = 60, m\angle GCA = 60,$  and  $m\angle BCA = 120^\circ$   
 35.  $m\angle ACD = 60$  and  $m\angle DCH = 20$ . Find  $m\angle HCA$ .  
 *$m\angle HCA = 40^\circ$*   
 32. Algebra  $BC = 3x + 2$  and  $CD = 5x - 10$ . Solve for  $x$ .  
 *$3x + 2 = 5x - 10$        $x = 6$*   
 33. Algebra If  $AC = 5x - 16$  and  $CF = 2x - 4$ , then  $AF =$  *8*.  
 *$5x - 16 = 2x - 4$        $x = 4$*



36. Algebra In the figure at the right,  $m\angle PQR = 4x + 47$ . Find  $m\angle PQS$ . *31*  
 *$4x + 47 = 36 + 7x - 4$        $x = 5$*



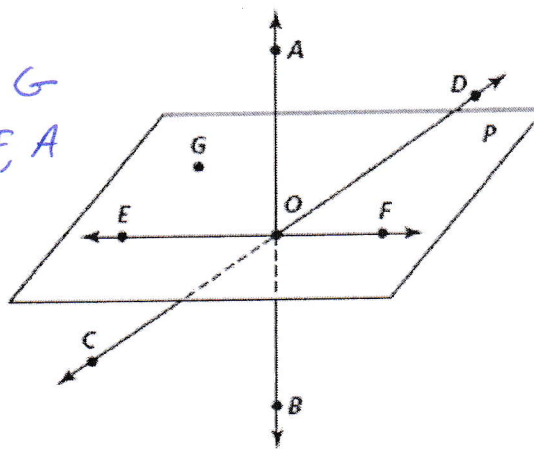
37. Algebra Points  $A, B,$  and  $C$  are collinear with  $B$  between  $A$  and  $C$ .  
 $AB = 4x - 1, BC = 2x + 1,$  and  $AC = 8x - 4$ . Find  $AB, BC,$   
 and  $AC$ .



*$4x + 1 + 2x + 1 = 8x - 4$*   
 *$x = 2$*   
 *$AB = 7$        $BC = 5$        $AC = 12$*

Use the figure to answer Exercises 8–11.

8. Name three collinear points.  $E, O, F$   
 9. Name four coplanar points.  $E, O, F, G$   
 10. Name four noncoplanar points.  $E, O, F, A$   
 11. Find each intersection.



- a.  $\overleftrightarrow{CD}$  and plane  $P$   $O$   
 b.  $\overleftrightarrow{EF}$  and plane  $P$   $\overleftrightarrow{EF}$   
 c.  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$   $O$   
 d. plane  $P$  and point  $G$   $G$

16. Algebra  $MP = 62$ . Use the figure to find each of the following.

- a.  $x$   
 b.  $MR$   
 c.  $RP$



$$2x + 3x + 7 = 62$$

$$x = 11$$

$$MR = 22$$

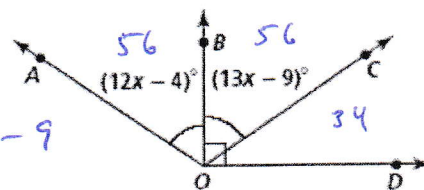
$$RP = 39$$

Use the figure to find each measure in Exercises 17–22.

17.  $m\angle AOB = 56$   
 19.  $m\angle COD = 34$   
 21.  $m\angle AOD = 146$

$$12x - 4 = 13x - 9$$

$$5 = x$$



Find the distance between each set of points to the nearest tenth.

30.  $M(3, 2), N(7, 9)$

$$d = \sqrt{(7-3)^2 + (9-2)^2}$$

$$d = \sqrt{16+49} = \sqrt{65}$$

31.  $C(-3, 8), D(5, 5)$

$$d = \sqrt{(5-(-3))^2 + (5-8)^2}$$

$$d = \sqrt{4+9} = \sqrt{13}$$

32.  $R(0, 12), S(8, -6)$

$$d = \sqrt{(-6-12)^2 + (8-0)^2}$$

$$d = \sqrt{324+64}$$

$$d = \sqrt{388}$$

33. The coordinates of the midpoint of  $\overline{AC}$  are  $(2, -3)$ . The coordinates of A are  $(0, 5)$ . Find the coordinates of C.  
 $A(0, 5)$   
 $M(2, -3)$   
 $C(4, -11)$

35. Find the midpoint of segment RS if point R has coordinates  $(-4, 5)$  and point S has coordinates  $(3, -1)$ .

$$\left( \frac{-4+3}{2}, \frac{5+(-1)}{2} \right)$$

$$\left( -\frac{1}{2}, 2 \right)$$

The measure of angle A is  $3x + 6$  and the measure of angle B is  $2x - 1$ .

36. If A and B are complementary, what is the value of  $x$ ?  $x = 17$

37. If A and B are supplementary, what is the value of  $x$ ?

$$x = 35$$

Lessons 2-1 and 2-2

$$3x + 6 + 2x - 1 = 180$$

$$5x = 175$$

$$x = 35$$

$$3x + 6 + 2x - 1 = 90$$

$$5x = 85$$

$$x = 17$$

For Exercises 1–3, identify the hypothesis and conclusion of each conditional.

3. If lines  $k$  and  $m$  are skew, then lines  $k$  and  $m$  are not perpendicular.

hypothesis

conclusion

For each of the statements, write the conditional form and then the converse of the conditional. If the converse is true, combine the statements as a biconditional.

5. The number one is the smallest positive square.

6. Rectangles have four sides.

9. Three points on the same line are collinear.

#### Lesson 2-2

Is each statement a good definition? If not, find a counterexample.

10. A real number is an even number if its last digit is 0, 2, 4, 6, or 8.

11. A circle with center  $O$  and radius  $r$  is defined by the set of points in a plane a distance  $r$  from the point  $O$ .

12. A plane is defined by two lines.

13. Segments with the same length are congruent.

For Exercises 14 and 15, write the two statements that form each biconditional. Tell whether each statement is *true* or *false*.

14. Lines  $m$  and  $n$  are skew if and only if lines  $m$  and  $n$  do not intersect.

15. A person can be president of the United States if and only if the person is a citizen of the United States.

#### Lesson 2-3

Using the statements below, apply the Law of Detachment or the Law of Syllogism to draw a conclusion.

16. If Jorge can't raise money, he can't buy a new car. Jorge can't raise money.

17. If Shauna is early for her meeting, she will gain a promotion. If Shauna wakes up early, she will be early for her meeting. Shauna wakes up early.
18. If Linda's band wins the contest, they will win \$500. If Linda practices, her band will win the contest. Linda practices.
19. If Brendan learns the audition song, he will be selected for the chorus. If Brendan stays after school to practice, he will learn the audition song. Brendan stays after school to practice.

**For Exercises 20–23, apply the Law of Detachment, the Law of Syllogism, or both to draw a conclusion. Tell which law(s) you used.**

20. If you enjoy all foods, then you like cheese sandwiches. If you like cheese sandwiches, then you eat bread.
21. If you go to a monster movie, then you will have a nightmare. You go to a monster movie.
22. If Catherine is exceeding the speed limit, then she will get a speeding ticket. Catherine is driving at 80 mi/h. If Catherine is driving at 80 mi/h, then she is exceeding the speed limit.
23. If Carlos has more than \$250, then he can afford the video game he wants. If Carlos worked more than 20 hours last week, then he has more than \$250. If Carlos works 15 hours this week, then he worked more than 20 hours last week.

**For Exercises 19–22, determine whether each statement is a good definition. If it is not, provide a counterexample.**

19. A square has four congruent sides. *No, a rhombus has 4 congruent sides*
20. Congruent angles have the same measure. *yes, good def*
21. Supplementary angles are two angles whose measures add up to 180. *yes, good def*
22. A bird is an animal with wings. *No, a bug can have wings.*

For each statement, (a) write the converse, and (b) decide whether the converse is true or false.

1. If a polygon is a triangle, then it has three sides.

If a polygon has 3 sides, then it is a triangle. T

2. If George lives in Texas, then he lives in the United States.

If George lives in the U.S., then he lives in Texas. F

3. If two angles are vertical angles, then they are congruent.

If 2 angles are congruent, then they are vertical angles. F

For Exercises 14–17, use deductive reasoning to draw any possible conclusions. Write *not possible* if you cannot draw any conclusions.

14. If an animal is a snake, then it is a reptile. "Gordon" is a reptile.

Not possible

15. If Susan gets a hit this inning, then we will win. Susan hits a triple.

We will win

16. If the bus is late, then we will be late for school. If we are late for school, then we will receive a tardy penalty.

If the bus is late, then we will receive a tardy penalty.

17. If two angles are complementary, then the sum of their measures is 90.  $\angle A$  and  $\angle B$  are complementary.

The sum of  $\angle A$  &  $\angle B$  is  $90^\circ$

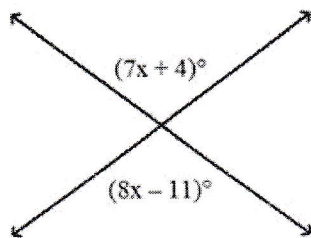
18. Rewrite the following biconditional as two conditionals:

A quadrilateral is a rectangle if and only if it has four right angles.

If a quadrilateral is a rectangle, then it has four right angles.

If a quadrilateral has four right angles, then it is a rectangle

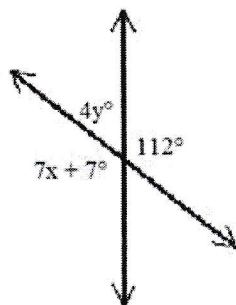
Find the value of  $x$ .



$$7x + 4 = 8x - 11$$

$$15 = x$$

Find the values of  $x$  and  $y$ .

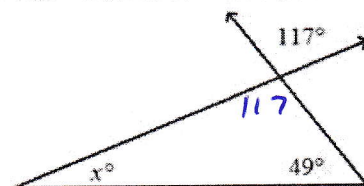


$$7x + 7 = 112$$

$$x = 15$$

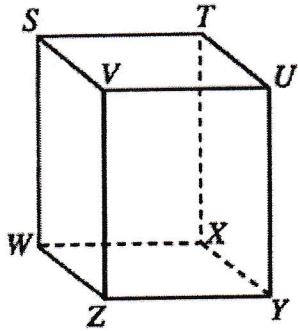
$$4y + 112 = 180 \quad y = 17$$

Find the value of the variable.



$$180 - 117 - 49 = x$$

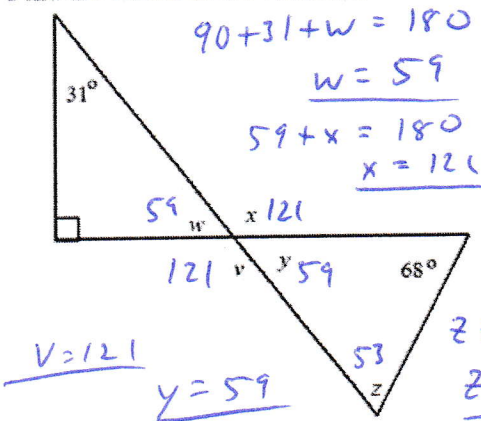
$$x = 14$$



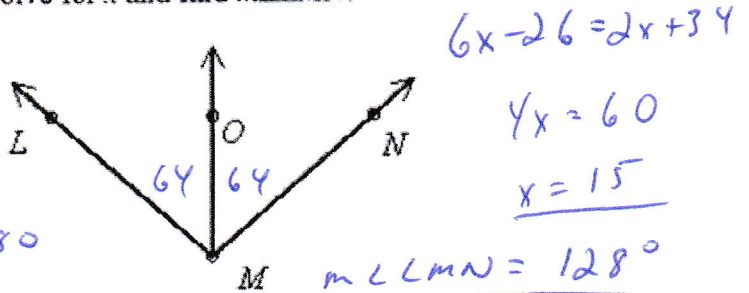
What is the intersection of plane  $WSZ$  and plane  $ZXY$ ?  $\leftarrow WX$

Name a fourth point in plane  $WUX$ .  $\checkmark$

Find the values of the variables.

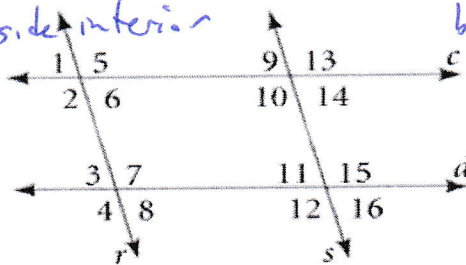


$\overrightarrow{MO}$  bisects  $\angle LMN$ ,  $m\angle LMO = 6x - 26$ ,  
and  $m\angle NMO = 2x + 34$ .  
Solve for  $x$  and find  $m\angle LMN$ .



Refer to the diagram at the right. Use the given information to determine which lines, if any, must be parallel. If any lines are parallel, use a theorem or postulate to tell why.

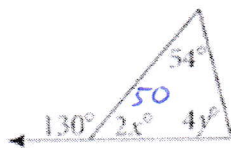
- 6.  $\angle 9 \cong \angle 14$  No parallel lines, vertical angles
- 8.  $\angle 2$  is supplementary to  $\angle 3$ .  $c \parallel d$ , same side interior
- 10.  $m\angle 6 = 60, m\angle 13 = 120$  (see left)
- 12.  $\angle 3$  is supplementary to  $\angle 10$ . No parallel lines
- 7.  $\angle 1 \cong \angle 9$   $c \parallel s$ , corresponding angles
- 9.  $\angle 7 \cong \angle 10$  No parallel lines
- 11.  $\angle 4 \cong \angle 13$  No parallel lines
- 13.  $\angle 10 \cong \angle 15$   $c \parallel d$ , alternate interior angles



10.  $r \parallel s$  if  $m\angle 13 = 120$ ,  
then  $m\angle 14 = 60$ .  
 $\angle 14 \cong \angle 26$ , lines para  
by converse of  
Corresponding  $\angle$ 's  
Postulate

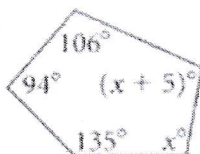
Algebra Find the value of each variable.

20.



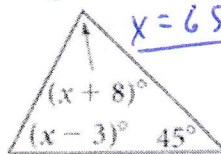
$130 + 2x = 180$   
 $x = 25$   
 $50 + 5y + 4y = 180$   
 $y = 19$

21.



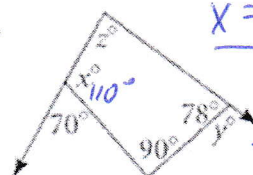
$106 + 94 + 135 + x + x + 5 = 540$   
 $x = 100$

22.



$(x+8) + (x-3) + 45 = 180$   
 $x = 65$

23.

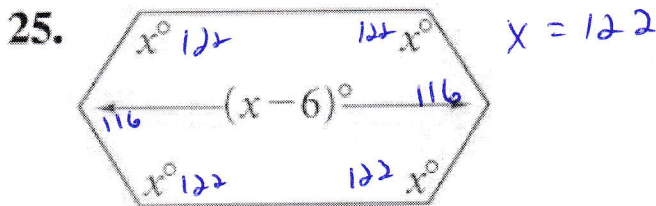
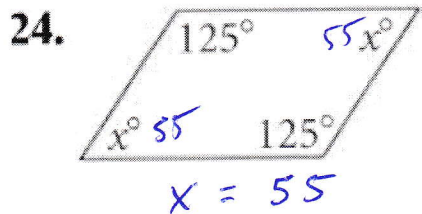


$x + 7 = 180$   
 $x = 110$   
 $180 = y + 71$   
 $y = 102$   
 $110 + 90 + 78 + z = 360$   
 $z = 82$

Algebra Find the missing angle measures.

$$x + x + 8 + x + (x - 6) + (x - 6) = 720$$

$$6x - 12 = 720$$



Lessons 3-6

Write an equation in point-slope form of the line that contains the given points.

26.  $A(4, 2), B(6, -3)$

27.  $C(-1, -1), D(1, 1)$

$$y - 2 = -\frac{5}{2}(x - 4)$$

$$y + 1 = (x + 1)$$

Write an equation in slope-intercept form of the line through the given points.

30.  $H(2, 7), J(-3, 1)$

31.  $M(-2, 4), N(5, -8)$

$$y = \frac{6}{5}x + \frac{13}{5}$$

$$y = -\frac{12}{7}x + \frac{4}{7}$$

Lessons 3-6 and 3-7

Graph each pair of lines and state whether they are parallel, perpendicular, or neither. Explain.

34.  $y = 4x - 8$

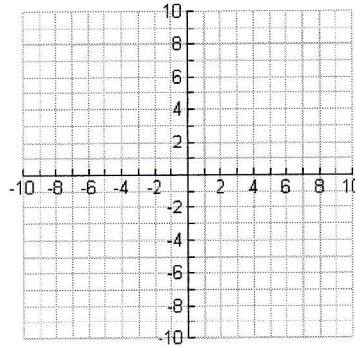
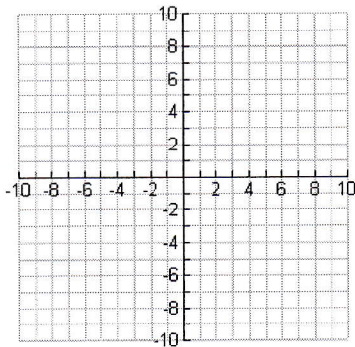
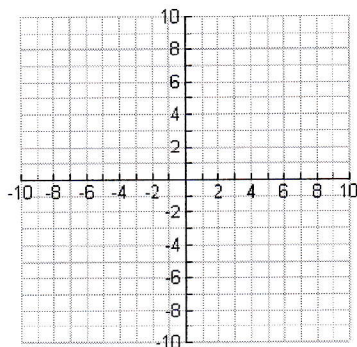
35.  $13y - x = 7$

36.  $y = \frac{-4}{3}x + 2$

$$y = 4x - 2$$

$$7 - \frac{y}{2} = x$$

$$\frac{4}{3}y = x - 1$$



Without graphing, tell whether the lines are parallel, perpendicular, or neither. Explain.

38.  $2x + 3y = 5$   
 $5x - 10y = 30$

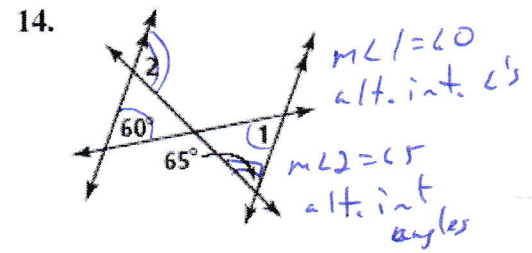
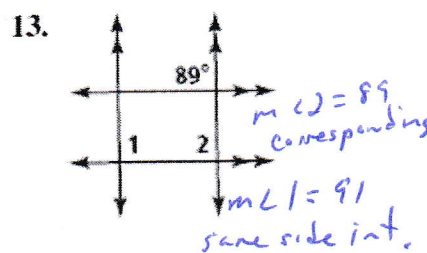
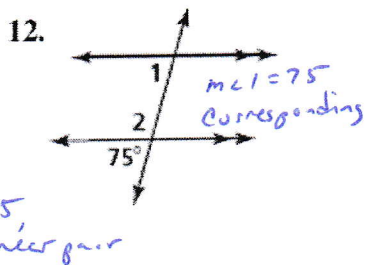
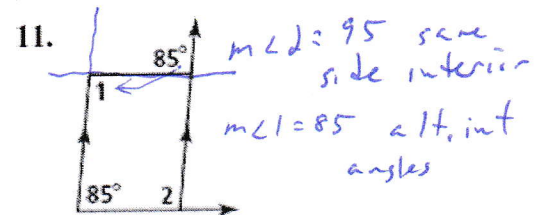
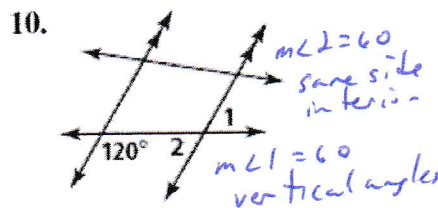
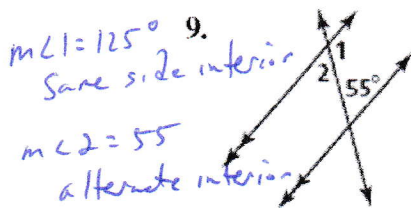
39.  $y = -2x + 7$   
 $x - 2y = 8$

40.  $5x - 3y = 0$   
 $y = \frac{5}{3}x + 2$

Practice Chapter Test  
 Chapter 3

Form A

Find  $m\angle 1$  and  $m\angle 2$ . State the theorems or postulates that justify your answers.



Regular Polygon	#of Sides	Interior Angle Sum	ONE interior angle	Exterior Angle Sum	ONE exterior angle
Pentagon	5	540	108	360	72
Octagon	8	1080	135	360	45
Decagon	10	1440	144	360	36
Dodecagon	12	1800	150	360	30
24-gon	24	3960	165	360	15
100-gon	100	17,640	176.4	360	3.6

Write the equation of each line described.

32. The line is perpendicular to  $y = 2x + 17$  and contains  $(8, -1)$ .

$m = 2$   
 $\perp m = -\frac{1}{2}$   $x_1, y_1$

$y - (-1) = -\frac{1}{2}(x - 8)$        $y + 1 = -\frac{1}{2}(x - 8)$