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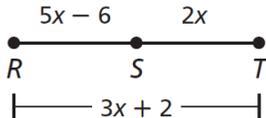
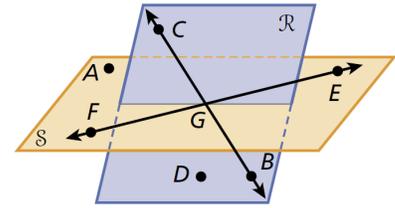
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# Advanced Geometry – S1 Final Review

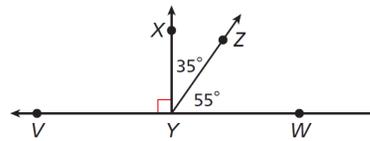
## Chapter 1 – Basics of Geometry

1. Name 3 collinear points on plane R.
2. Give another name for plane S.
3. Name the intersection of line BC and Plane S.
4. Name a ray with endpoint E.
5. S is between R and T. Find RT.

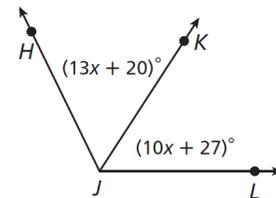


6. Y is between X and Z.  $XY = 13.8$ , and  $XZ = 21.4$ . Find  $YZ$ .
7. Q is between P and R.  $PQ = 3x$ ,  $QR = 6x + 4$ , and  $PR = 14x - 6$ . Find  $PR$ .
8. U is the Midpoint of TV,  $TU = 3X + 4$ , and  $UV = 5X - 2$ . Find  $TU$ ,  $UV$ , and  $TV$ .
9. E is the midpoint of DF,  $DE = 9X$ , and  $DF = 20X - 4$ . Find  $DE$ ,  $EF$ , and  $DF$ .
10. Classify each angle as acute, right, or obtuse.

- a.  $\angle XYW$       b.  $\angle ZYV$       c.  $\angle XYZ$



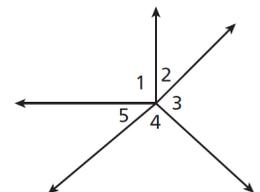
11. K is in the interior of  $\angle HJL$ . If  $m\angle HJL = 116^\circ$ , find the  $m\angle HJK$ .



12.  $\overrightarrow{NP}$  bisects  $\angle MNQ$ ,  $m\angle MNP = (6x - 12)^\circ$ , and  $m\angle PNQ = (4x + 8)^\circ$ . Find  $m\angle MNQ$ .

Tell whether the angles are only adjacent, adjacent and form a linear pair, or not adjacent.

13.  $\angle 1$  and  $\angle 2$       14.  $\angle 3$  and  $\angle 4$       15.  $\angle 2$  and  $\angle 5$

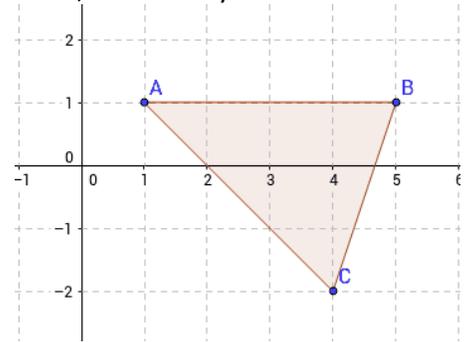


16. The  $m\angle A = (2x + 30)^\circ$  and  $m\angle B = (3x - 20)^\circ$ . If  $\angle A$  and  $\angle B$  are supplementary, what is the  $m\angle B$ ?

17. What is the distance from X(-2, 4) to Y(6,1).
18. If L(-4, 2) and M(3, -2), what is LM?
19. Given  $\overline{AY}$  with endpoints A(5, 9) and Y(-11, 3) and midpoint M, what are the coordinates for M?
20. B is the midpoint of  $\overline{AY}$ . A has coordinates (3, 2) and B has coordinates (-1,4). What are the coordinates of Y?
21. Find the area and perimeter of triangle ABC. Round answers to the nearest tenth, if necessary.

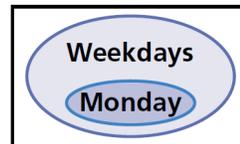
Perimeter: \_\_\_\_\_

Area: \_\_\_\_\_



## Chapter 2 – Reasoning and Proofs

1. What is the next item in each pattern?
  - a. 1, -3, 9, -27, ....
  - b. 2, 5, 9, 14, 20, ....
2. Give a counterexample to show that the following conjecture is false:  
"If  $\angle 1$  and  $\angle 2$  are complementary, then the angles are not congruent."
3. Give a counterexample to show that the following conjecture is false:  
"If  $\angle 1$  and  $\angle 2$  are congruent, then they are both obtuse angles."
4. Determine if the following are true. If false, give a counterexample.
  - a. If  $9x - 11 = 2x + 3$ , then  $x = 2$ .
  - b. If an angle is acute, then it has a measure of  $30^\circ$ .
5. Write a conditional statement from the Venn Diagram.

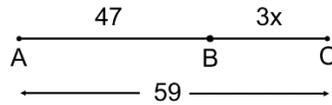


6. Write the converse, inverse, and contrapositive. Determine if each statement is true or false.  
"If you live in Oklahoma, then you live in the United States."
7. Use the true statements below to determine whether each conclusion is true or false.  
"Sue is a member of the swim team. When the team practices, Sue swims. The team begins practice when the pool opens. The pool opens at 8 AM on weekdays and at noon on Saturdays."  
  - a. The swim team practices on weekdays only. \_\_\_\_\_
  - b. Sue swims on Saturdays. \_\_\_\_\_
  - c. Swim team practice starts at the same time every day. \_\_\_\_\_
8. Which conclusion is valid for the situation below?  
If two angles are complementary, then the sum of their measures is  $90^\circ$ .  
 $\angle A$  and  $\angle B$  are complementary.
  - a.  $m\angle A = 90^\circ$
  - b.  $m\angle A = 90^\circ + m\angle B$
  - c.  $m\angle A + m\angle B = 90^\circ$
  - d.  $\angle A$  and  $m\angle B$  form a right angle.
9. Write the following statements as bi-conditional statements.
  - a. The measure of a right angle is  $90^\circ$ .
  - b. If this month is September, then next month is October.

10. Solve each problem for the missing variable. Write a justification for each step.

a.  $\frac{m}{-5} + 3 = -4.5$

b.



11. Write a justification for each step. Given:  $\angle 1$  and  $\angle 2$  complementary and  $\angle 1 \cong \angle 3$ .

$\angle 1$  and  $\angle 2$  complementary

$$m\angle 1 + m\angle 2 = 90^\circ$$

$\angle 1 \cong \angle 3$

$$m\angle 1 = m\angle 3$$

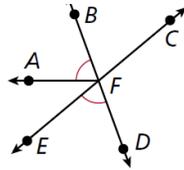
$$m\angle 3 + m\angle 2 = 90^\circ$$

$\angle 3$  and  $\angle 2$  complementary

12.

**Given:**  $\angle AFB \cong \angle EFD$

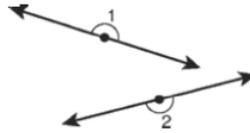
**Prove:**  $\overrightarrow{FB}$  bisects  $\angle AFC$ .



13.

**Given:**  $\angle 1$  and  $\angle 2$  are straight angles.

**Prove:**  $\angle 1 \cong \angle 2$



### Chapter 3 – Parallel and Perpendicular Lines

Write the equation of the line in slope-intercept form given the following constraints:

1.  $(-2, -3)$  and  $(-4, 3)$
2.  $(-5, -5)$  and  $(-3, -1)$
3. parallel to  $y = -\frac{7}{3}x + 3$ ; through  $(-3, -1)$
4. perp. to  $y = \frac{1}{2}x + 2$ ; through  $(-3, -7)$
5. parallel to  $y = \frac{2}{5}x + 3$ ; through  $(3, 7)$
6. perp. to  $y = -3x - 5$ ; through  $(5, -2)$

Write the equation of the perpendicular bisector of segment AB:

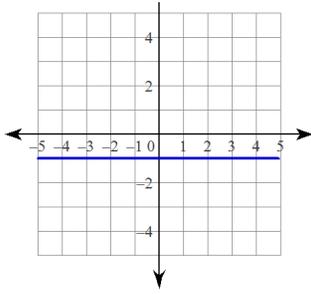
7.  $A(-2, -3)$ ,  $B(-4, 3)$
8.  $A(5, 3)$ ,  $B(-7, 7)$

Find the coordinates of point Q along the directed line segment LM so that LQ to QM is the given ratio.

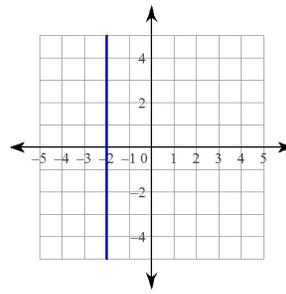
9.  $L(-1, -2)$ ,  $M(3, 6)$ ; ratio 5 to 3
10.  $L(2, 7)$ ,  $M(-1, 1)$ ; ratio 2 to 1

Write the equation of each line.

11.



12.

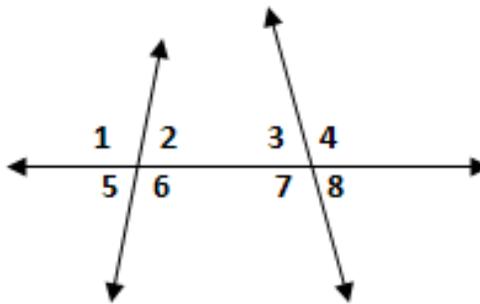


13. A vertical line through (2, -5)

14. A horizontal line through (4, -2)

15-21. Match the correct angle pair with the given set of angles.

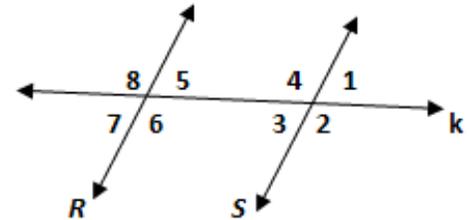
- A. Alternate Interior
- B. Consecutive Interior
- C. Alternate Exterior
- D. Corresponding
- E. Vertical
- F. Linear Pair
- G. No Relationship



- 15.  $\angle 1, \angle 8$  \_\_\_\_\_
- 16.  $\angle 3, \angle 6$  \_\_\_\_\_
- 17.  $\angle 3, \angle 7$  \_\_\_\_\_
- 18.  $\angle 1, \angle 6$  \_\_\_\_\_
- 19.  $\angle 5, \angle 8$  \_\_\_\_\_
- 20.  $\angle 2, \angle 4$  \_\_\_\_\_
- 21.  $\angle 6, \angle 7$  \_\_\_\_\_

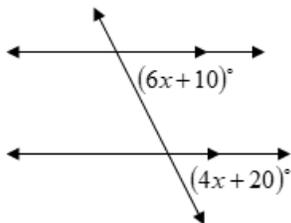
Use the figure to the right to answer #22-24

- 22. If R and S are parallel lines and  $\angle 1 = 4x - 3$  and  $\angle 7 = 3x + 4$ , find the measure of  $\angle 2$ .
- 23. If R and S are parallel lines and  $\angle 3 = 2x + 15$  and  $\angle 5 = 5x + 3$ , find the measure of  $\angle 2$ .
- 24. If R and S are parallel lines and  $\angle 5 = 3x + 30$  and  $\angle 4 = 5x + 22$ , find the measure of  $\angle 2$ .

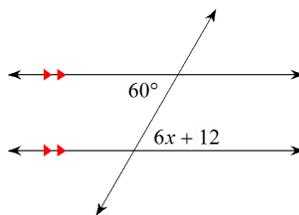


Find the value of all missing variables.

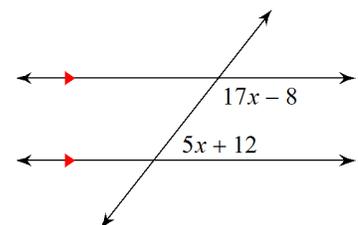
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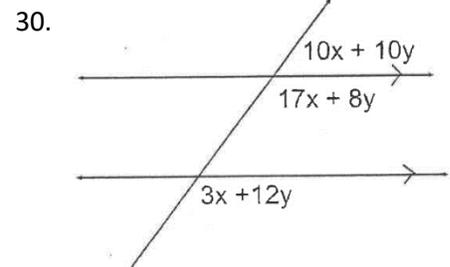
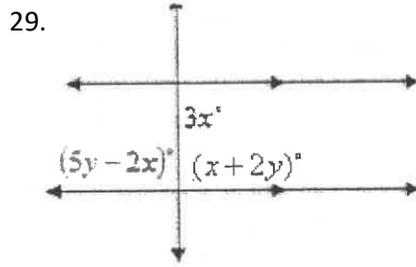
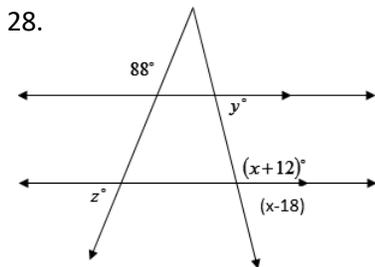


26.



27.

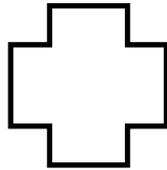
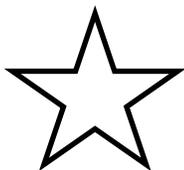




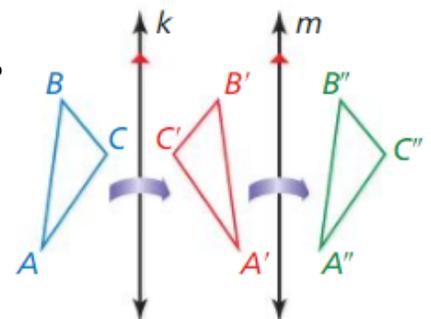
31. Find the distance from  $P(4, 8)$  to the line  $6 = y + 2x$ .
32. Find the distance from  $P(-2, 1)$  to  $y = \frac{1}{4}x - 3$ .
33. If  $A(4, 2)$  and  $B(8, 5)$ , find point  $C$  on the  $x$ -axis so that  $AC + BC$  is a minimum.

### Chapter 4 – Transformations

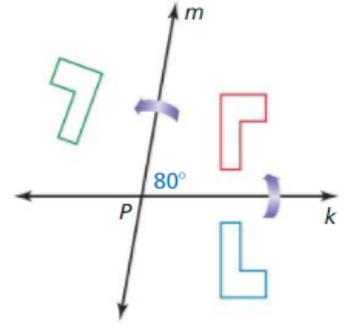
1. A dilation maps the preimage  $(-2, 3)$  onto the image  $(4, -6)$ . What is the scale factor of the dilation?
2. The base of a triangle measures 5 cm and the height measures 7 cm. After a dilation is performed by a scale factor of 3, what is the area of the new triangle?
3. A translation using the vector  $\langle -2, 5 \rangle$  is performed to create the image  $(4, -2)$ . What are the coordinates of the preimage?
4. What would the scale factor be of a dilation that rotates a figure  $180^\circ$  and makes the image a third of the size of the preimage?
5. Write a coordinate rule that would translate an image 3 units up and 4 units left.
6. A ferris wheel takes 40 seconds to complete a rotation. A seat that starts on coordinate  $(10, 0)$  is rotated for 10 seconds about the origin. What are the new coordinates for the seat after the rotation?
7. Determine a) how many lines of symmetry each figure has (if any) and b) What are the angles of rotational symmetry for each figure (if any)?



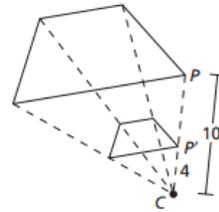
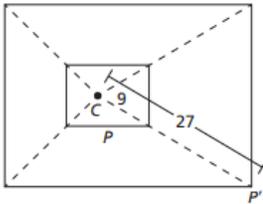
8. If a figure is rotated 100 degrees. Your friend tells you that this transformation could have also been completed by using a reflection over two intersecting lines. What would the angle be between those two intersecting lines in order to be equivalent to a 100 degree rotation?
9. Triangle  $ABC$  is reflected over line  $k$  and then reflected over line  $m$ . The distance between line  $k$  and  $m$  is 5 cm. The distance between point  $B$  and line  $k$  is 3 cm, and the distance between point  $C''$  and line  $m$  is 4 cm.
  - a. What is the distance from  $A$  to  $A''$ ?
  - b. What is the distance from  $B'$  to  $B''$ ?
  - c. What is the distance from  $C$  to  $C'$ ?
  - d. What single transformation is equivalent to these two reflections?



10. A figure is reflected over line  $k$  and then reflected over line  $m$ . What is the angle of rotation this figure could go through to end up in the same location?



11. Find the scale factor of each dilation. Tell whether it was an enlargement or reduction.



12. Describe the difference between a rigid motion and a non-rigid motion.

13. Find the image of  $A(5, -3)$  after...

- A reflection across the  $x$ -axis
- A reflection across the  $y$ -axis
- A reflection across the line  $y = x$
- A reflection across the line  $y = -4$
- A  $90^\circ$  rotation
- A  $180^\circ$  rotation
- A  $270^\circ$  rotation
- Translated in the vector  $\langle -4, 8 \rangle$
- Translated  $(x, y) \rightarrow (x + 3, y - 2)$