Geometry Part 2 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SOL Reporting Category 1: Reasoning, Lines, and Transformations

**Choose the best answer for each question.**

**Use the diagram for questions 1 – 3.**

Line r and lines are parallel. The measure of 1 is 82°.



1. What is the measure of 6?

1. 8°
2. 82°
3. 98°
4. 108°
5. Which angles are supplementary?
6. 1 and 3
7. 2 and 3
8. 3 and 5
9. 4 and 6
10. Which statement is **not** true?
11. 1 and 4 are congruent angles.
12. 3 and 6 are supplementary angles.
13. The sum of m2 and m7 is 180°.
14. 5 and 8 form a linear pair.
15. Two lines are cut by a transversal. Which of the following is enough to show that the two lines are parallel?
16. Two vertical angles are congruent.
17. Two corresponding angles are supplementary.
18. Two angles for a linear pair.
19. Two alternate interior angles are congruent.

**Use the diagram below for questions 5 – 7.**

Line g and line h are cut by a transversal, line k.



1. If m3 = 74°, m4 = 106°, and m6 = 68°, which of the following statements must be true?
2. Line g is parallel to line h.
3. Line g is not parallel to line h.
4. 3 8
5. 3 and 7 are supplementary.
6. Which of the following statements would be enough information to show that line g is parallel to line h?
7. m3 = m1
8. m3 = m5
9. m3 = 81°, m5 = 99°
10. m3 = 81°, m4 = 99°
11. If line g is parallel to line h and m4 = 112°, which of the following must be true?
12. m7 = 61°
13. m7 = 78°
14. m7 = 90°
15. m7 = 112°
16. A fence consists of parallel horizontal wires and slanted wooden fence posts at different angles.



What is the value of x in the diagram above?

1. 60°
2. 74°
3. 90°
4. 106°
5. Two parallel lines are cut by a transversal. If a pair of same-side interior angles are congruent, what is the measure of each of the two angles?

Angle 1 = \_\_\_\_\_\_\_ Angle 2 = \_\_\_\_\_\_\_

1. Which of the following can be used to show that lines l and m are **not** parallel to each other?



1. Show that the sum of the measures of angles 2 and 7 is less than 180°.
2. Show that the sum of the measures of angles 3 and 6 is less than 180°.
3. Show that the sum of the measures of angles 3 and 7 is less than 180°.
4. Show that the sum of the measures of angles 4 and 6 is less than 180°.
5. Lines l and m are intersected by line p.



For lines l and m to be parallel, what must be the value of x?

x = \_\_\_\_\_\_\_\_\_\_

1. What is the slope of $\overbar{MN}$?



1. -3
2. -2
3. $-\frac{2}{3}$
4. $-\frac{3}{2}$
5. What is the slope of a line that passes through (9, -8) and (-3, 12)?
6. $-\frac{5}{3}$
7. $-\frac{3}{5}$
8. $\frac{3}{10}$
9. $\frac{10}{3}$
10. What is the slope of a line that is perpendicular to the line whose equation is y = -x – 2?
11. -1
12. 0
13. ½
14. 1
15. Look at the line graphed below.



Which equation represents a line that is parallel to the line shown?

1. y = $\frac{4}{3}$ x + 2
2. y = $-\frac{3}{4}$ x
3. y = $-\frac{4}{3}$ x – 3
4. y = $\frac{3}{4}$ x – 4
5. Which equation represents a line that is perpendicular to the line whose equation is 3x – 5y = 15?
6. y = $\frac{5}{3}$ x + 4
7. y = $\frac{3}{5}$ x + 4
8. y = $-\frac{3}{5}$ x + 4
9. y = $-\frac{5}{3}$ x – 4
10. Which line segments are parallel?
	1. $\overbar{MN}$ with M(-3, 7) and N(6, -5)
	2. $\overbar{PQ}$ with P(5, -4) and Q(9, -1)
	3. $\overbar{TU}$ with T(-2, -4) and U(-8, 4)
11. I and II only
12. I and III only
13. II and III only
14. I, II, and III
15. If ABCD is a rectangle graphed on the coordinate plane, how does the slope of $\overbar{AB}$ compare to the slope of $\overbar{CD}$?
16. The slope of $\overbar{AB}$ is equal to the slope of $\overbar{CD}$.
17. The slope of $\overbar{AB}$ is the opposite of the slope of $\overbar{CD}$.
18. The slope of $\overbar{AB}$ is the reciprocal of the slope of $\overbar{CD}$.
19. The slope of $\overbar{AB}$ is the opposite reciprocal of the slope of $\overbar{CD}$.
20. Which equation represents a line that intersects y = $-\frac{1}{4}$ x – 6 at exactly one point?
21. 4y = -x
22. –y = $\frac{1}{4}$ x – 3
23. y = $-\frac{2}{8}$ x + 3
24. y = $-\frac{3}{9}$ x + 6
25. Triangle DEF has vertices D(0, 4), E(6, 2), and F(3, -7). Is ΔDEF a right triangle? Why or why not?
26. What is the length of $\overbar{AB}$ with endpoints A(-2, 3) and B(1, 2)?
27. $\sqrt{2}$ units
28. 2 units
29. $\sqrt{10}$ units
30. 10 units

**Use the figure below for questions 22 and 23.**



1. What is the length of $\overbar{MN}$?
2. $\sqrt{34}$
3. $2\sqrt{10}$
4. 8
5. $6\sqrt{2}$
6. What is the midpoint of $\overbar{MN}$?
7. (0.5, 3.5)
8. (1, 3)
9. (3, 2)
10. (3.5, 1.5)
11. Point C is the midpoint of $\overbar{AB}$. Point D is the midpoint of $\overbar{CB}$. If CD = 4 units, what is the length of $\overbar{AB}$?
12. 1 unit
13. 2 units
14. 8 units
15. 16 units
16. Point C is the midpoint of $\overbar{AB}$ with endpoints A(-2, 2) and B(1, -3). What is the length of $\overbar{AC}$?
17. $\frac{\sqrt{2}}{2}$ unit
18. $\frac{1}{2}$ unit
19. $\frac{\sqrt{34}}{2}$ units
20. $\sqrt{34}$ units
21. Point F is the midpoint of $\overbar{DE}$. Given D(3, 5) and F(0, 1), what are the coordinates of point E?
22. (-5, -5)
23. (-3, -3)
24. (1.5, 2)
25. (3, 1)

**Use the following information for questions 27 and 28.**

On the map below, Town Hall is located at the point (0, 0). Each unit on the grid represents 1 km. Allen lives 3 km east and 2 km north of Town Hall. Bartholomew lives 11 km east and 8 km north of Town Hall.



1. Allen and Bartholomew plan to meet exactly halfway between their houses. What are the coordinates of the location where they should meet?
2. (5, 7)
3. (6, 5)
4. (7, 4)
5. (7, 5)
6. What is the straight-line distance between Allen’s house and Bartholomew’s house?
7. $\sqrt{10}$ km
8. $\sqrt{28}$ km
9. 10 km
10. 28 km
11. Point S lies on segment $\overbar{QR}$. Point S has coordinates (-5, 0), point Q has coordinates (-8, -3), and QR = $6\sqrt{2}$. Verify that S is the midpoint of $\overbar{QR}$. Show your work.
12. How many lines of symmetry does the figure have?
13. 0
14. 1
15. 2
16. 3
17. How many lines of symmetry does a regular pentagon have?
18. 2
19. 3
20. 4
21. 5
22. Which of the figures below does **not** have point symmetry?
23. . C. 



1. . D.
2. What kind of symmetry does the figure have?



1. Point symmetry and line symmetry
2. Point symmetry only
3. Line symmetry only
4. No symmetry
5. ΔDEF has coordinates D(5, 2), E(5, -2), and F(-4, 0). Which of the following statements is true about ΔDEF?
6. The triangle has o lines of symmetry.
7. Both the x-axis and y-axis are lines of symmetry.
8. The x-axis is the only line of symmetry.
9. The y-axis is the only line of symmetry.
10. Quadrilateral LMNO has coordinates L(0, 4), M(5, 0), N(0, -3), and O(-6, 0). What kind of symmetry does LMNO have?
11. No symmetry
12. Point symmetry only
13. Line symmetry only
14. Point symmetry and line symmetry
15. How many lines of symmetry does the equilateral triangle have? Draw the lines of symmetry on the figure below.

\_\_\_\_\_\_\_\_\_\_

1. Jessica constructed segment LP by setting her compass span to the length of segment JK.



Which statement must be true about this construction?

1. Line segments JK and LP are congruent.
2. Line segments JK and LM are congruent.
3. Line segments JK and PM are congruent.
4. Point P is the midpoint of $\overbar{LM}$.
5. The diagram below shows two steps in a construction. One step shows the distance between points C and E being measured on CDE with a compass. The second step shows the same compass span being used to swing an arc from point E’. Which construction is being performed?



1. Copying a line segment
2. Drawing the perpendicular bisector of a line segment
3. Copying an angle
4. Drawing an angle bisector

**Use the diagram for questions 39 and 40.**



1. Which construction is shown above?
2. Copying a line segment
3. Drawing the bisector of a line segment
4. Copying an angle
5. Drawing an angle bisector
6. Which statement must be true of the construction shown above?
7. Point Z is the midpoint of $\overbar{MN}$.
8. Point M is the midpoint of $\overbar{MN}$.
9. $\overbar{MN}$ is congruent to $\overbar{JK}$.
10. $\overbar{MN}$ is congruent to $\overbar{JZ}$.
11. Hector is drawing architectural blueprints for a building. In the blueprints, RST is a right angle representing the corner of a room.



Hector wants to draw a new angle, XYZ, that measures exactly 45° to use elsewhere in the blueprints. Which of the following constructions should he use?

1. Copying RST only
2. Bisecting $\overbar{ST}$ only
3. Constructing the perpendicular bisector of $\overbar{ST}$ and then copying $\overbar{ST}$
4. Constructing the angle bisector of RST and then copying one of the resulting 45° angles
5. Anoki used a compass and straightedge to construct the figure below.



Which statement is **not** true about the diagram?

1. $\overbar{AB}$ is congruent to $\overbar{CD}$.
2. $\overbar{AE}$ is congruent to $\overbar{BE}$.
3. AEC and BEC are both right angles.
4. AED and BED are both right angles.