

TEST NAME: Math Geometry FAIM 2016 Form 2-A

TEST ID: 1549482

GRADE: Ninth Grade - Twelfth Grade

SUBJECT: Mathematics

TEST CATEGORY: State Interim Assessment

Student:

Class:

Date:

Instructions

Use your Response Document to answer question 13.

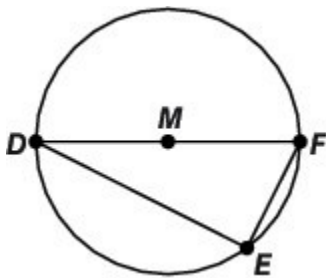
1. Two circles have the same center but different radii. Which is a correct statement about the circles?
 - A. Since the circles can be mapped onto each other by dilation about their center, the circles are similar.
 - B. Since the circles can be mapped onto each other by translation about their center, the circles are similar.
 - C. Since the circles cannot be mapped onto each other by dilation about their center, the circles are not similar.
 - D. Since the circles cannot be mapped onto each other by translation about their center, the circles are not similar.

2. Which characteristics will NOT prove that quadrilateral $PQRS$, drawn in a coordinate plane, is a parallelogram?
 - A. The slopes and lengths of \overline{PQ} and \overline{RS} are equal.
 - B. The slopes of \overline{PQ} and \overline{RS} are equal, and the slopes of \overline{QR} and \overline{SP} are equal.
 - C. The slopes of \overline{PQ} and \overline{RS} are equal, and the lengths of \overline{QR} and \overline{SP} are equal.
 - D. The lengths of \overline{PQ} and \overline{RS} are equal, and the lengths of \overline{QR} and \overline{SP} are equal.

3. Which of these are essential characteristics needed to properly define a circle? Select all that apply and write the numbers corresponding to the characteristics in the answer space.

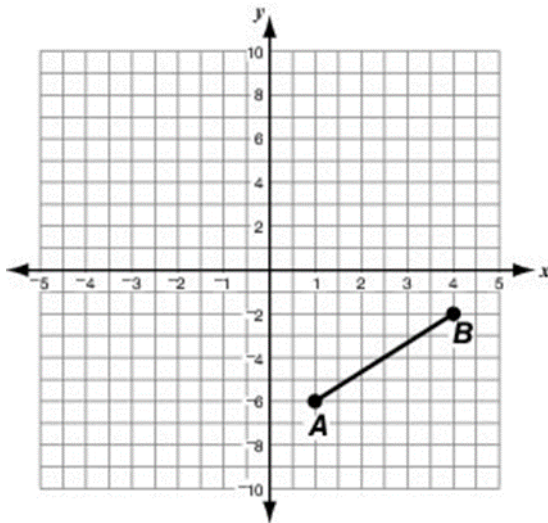
1. the measure of the radius
2. a set of points on a plane
3. a line drawn through a specified point
4. the measure of an angle that forms a sector
5. a central, fixed point
6. the measure of the circumference

4. In circle M shown below, $m\angle DEF = (5x - 10)^\circ$.



What is the value of x ?

5. The line segment \overline{AB} is shown below.



Which transformation of \overline{AB} will produce a line segment $\overline{A'B'}$ that is parallel to \overline{AB} ?

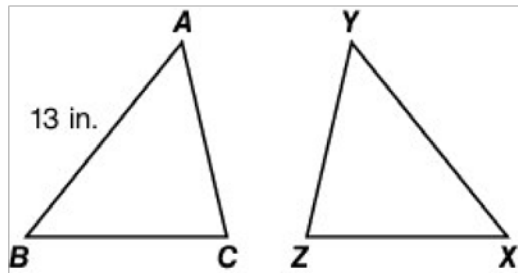
- A. Rotation of 180° about point B
 - B. Rotation of 90° about point B
 - C. Reflection over the x -axis
 - D. Translation down 2 units
6. The coordinates of the endpoints of \overline{AB} are $A(-2, -5)$ and $B(4, 3)$.

Part A. What are the coordinates of a point C that divides \overline{AB} such that $AC:CB$ is equal to 1:3?

Part B. Find the ratio in which the x -axis divides \overline{AB}

Use words and/or numbers to show your work.

7. Triangle ABC is transformed to form triangle XYZ .



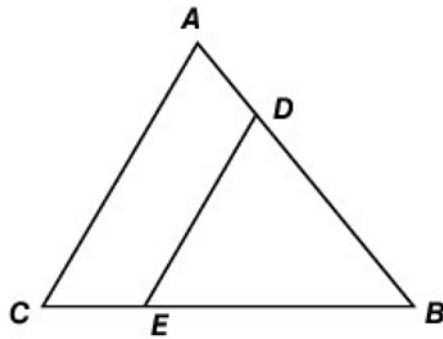
If $AC = BC$ and the perimeter of $\triangle ABC$ is 37 inches (in.), what are the lengths of the sides of $\triangle XYZ$ that would make $\triangle ABC \cong \triangle XYZ$?

- A. $XY=13$ in.; $YZ=13$ in.; $XZ=11$ in.
- B. $XY=13$ in.; $YZ=12$ in.; $XZ=12$ in.
- C. $XY=12$ in.; $YZ=12$ in.; $XZ=13$ in.
- D. $XY=11$ in.; $YZ=13$ in.; $XZ=13$ in.

8. Using the figure shown, complete the following.
- Write statements and reasons to complete the proof.

Given: $\overline{DE} \parallel \overline{AC}$

Prove: $\frac{AD}{DB} = \frac{CE}{EB}$



Proof:

Statements	Reasons

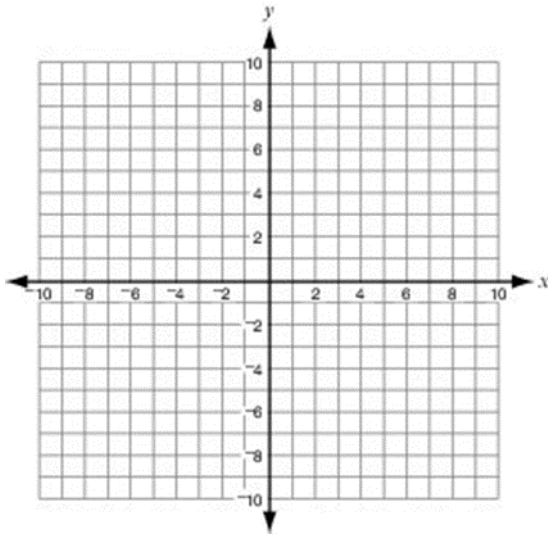
- Why was the given information necessary to show that this relationship was true? What else could the given have stated that would allow this proportional relationship to be proven? Explain.

Use words and/or numbers to show your work.

9. The owner of Sweeties Candy Store wanted to create a new package for her specialty candy. She cut shapes out of cardboard to try to create a new package. The shapes she was working with included a regular pentagon, a square, an equilateral triangle, and a rectangle. Which combination of shapes can the owner use to make a completed package?
- A. She can use 5 rectangles and 2 pentagons to make a pentagonal prism.
 - B. She can use 3 rectangles and 2 triangles to make a triangular pyramid.
 - C. She can use 2 squares and 3 rectangles to make a rectangular prism.
 - D. She can use 3 triangles and 1 square to make a square pyramid.

10. The segment with endpoints at $S(5,32)$ and $T(-6,8)$ is rotated and then dilated. Which attribute determines the length of the segment after those transformations?
- A. the center of the dilation
 - B. the center of the rotation
 - C. the scale factor of the dilation
 - D. the number of degrees in the rotation
11. If the radius of the base of a cylinder is twice that of a cone and its height is half the height of the cone, how are the volumes of cylinder, V_{cyl} , and cone, V_{cone} , related?
12. Halah drew right triangle $\triangle JKL$. She then drew $\triangle RST$, which was a dilation of $\triangle JKL$ by a scale factor of 0.25 with a center of dilation at point J . Which of these can be used to prove that $\triangle RST$ is similar to $\triangle JKL$?
- A. $m\angle T = m\angle L$ and $m\angle R = m\angle J$
 - B. $m\angle T = 0.25m\angle L$ and $m\angle R = m\angle J$
 - C. $m\angle T = m\angle L$ and $m\angle R = 0.25m\angle J$
 - D. $m\angle T = 0.25$, $m\angle L$ and $m\angle R = 0.25(m\angle J)$

13. Michaela uses straight lines to join points $A(6, 8)$, $B(9, 4)$, $C(1, -2)$, and $D(-2, 2)$ to form a quadrilateral on a coordinate plane.
- Draw quadrilateral ABCD on a coordinate plane like the one shown below. Label each point.



- What is the perimeter of the given quadrilateral? Show your work.
- Michaela says the area of the quadrilateral can be found by multiplying the lengths of the sides. Is she correct? Explain.

Use words and/or numbers to show your work.

Place an "X" in the answer box below.

Answer the question on the Response Document provided.

Click next.

14. Shawna is constructing a figure using a compass and straightedge. She begins with rectangle $PQRS$.
- Using a radius on her compass greater than one-half the length of \overline{PS} she draws 2 circles, one centered at P and the other at S , that intersect on both sides of \overline{PS} .
 - With her straightedge, Shawna draws a line through the points of intersection of the two circles. She then labels the point where this line intersects \overline{PS} as W and the point where this line intersects \overline{QR} as Y .

Shawna repeats this process at \overline{PQ} as follows:

- Taking a radius greater than one-half the length of \overline{PQ} , she draws 2 circles, one centered at P and the other at Q , that intersect on both sides of \overline{PQ} .
- With her straightedge, Shawna draws a line through the points of intersection of the two circles. She then labels the point where this line intersects \overline{PQ} as X and the point where this line intersects \overline{SR} as Z .

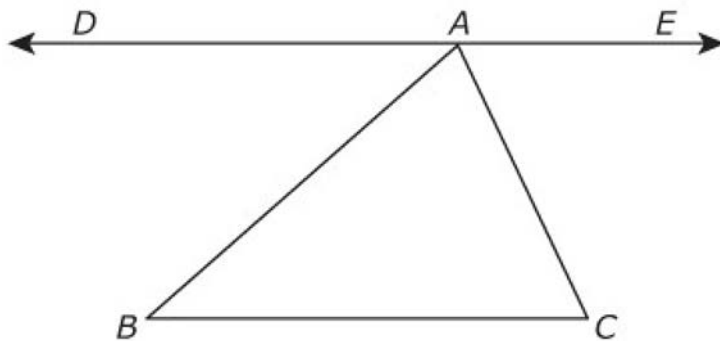
With her straightedge, Shawna connects W , X , Y , and Z in order and closes the figure by connecting Z to W .

Which description best defines the closed figure formed by $WXYZ$?

- A. a kite with an area that is one-fourth that of $PQRS$
 - B. a square with an area that is one-fourth that of $PQRS$
 - C. a rectangle with an area that is one-half that of $PQRS$
 - D. a parallelogram with an area that is one-half that of $PQRS$
15. Sandra is flying a kite at the end of a string that forms a straight segment that is 250 feet long. She holds the bottom of the string 3.5 feet above the ground. The angle formed by the string and ground level is 70° . What is the vertical distance, in feet, between the kite and the ground? Round your answer to the nearest foot.

16. Which of these needs to be completed first in order to construct a circle that circumscribes a triangle?
- A. the perpendicular bisectors of any two sides of the triangle
 - B. the lines perpendicular to any two sides of the triangle
 - C. the altitudes of any two sides of the triangle
 - D. the medians of any two sides of the triangle
17. If $0^\circ \leq a \leq 180^\circ$ and $\cos(a) = \sin(32^\circ)$, what is the value of a ?

18. Consider $\triangle ABC$ shown below.



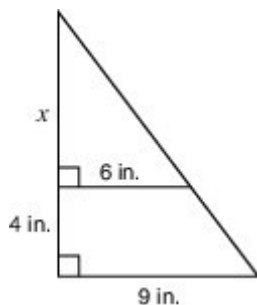
Part A

Line DE is drawn through Point A and parallel to segment BC . Prove that the sum of the 3 interior angles of $\triangle ABC$ is 180° .

Part B

Consider the exterior angles of any triangle. What is the sum of the exterior angles of a triangle, one at each vertex? Justify your answer.

19. What is the value of x in the given triangle, in inches?



20. On a coordinate plane, the line $3x - 4y = 8$ contains segment AB , which is one side of rectangle $ABCD$. What is the slope of the line that contains segment BC ?

A. $\frac{4}{3}$

B. $\frac{3}{4}$

C. $-\frac{3}{4}$

D. $-\frac{4}{3}$