

**High School HS Geometry**  
**1819 GSE Geometry Similarity, Congruence & Proofs Unit 2 Full Touchstone**

ID: 294455 — Standard: GSE G-SRT.1a

1. A student constructs the image of line segment  $AB$  under a dilation with center  $O$ , not on the segment, with a scale factor of 3. Which describes the image of the line segment?
- A. The image of line segment  $AB$  is a line segment parallel to  $AB$ .
  - B. The image of line segment  $AB$  is a line segment perpendicular to  $AB$ .
  - C. The image of line segment  $AB$  is a line segment passing through point  $O$  that intersects  $AB$ .
  - D. The image of line segment  $AB$  is a line segment passing through point  $O$  that leaves  $AB$  unchanged.

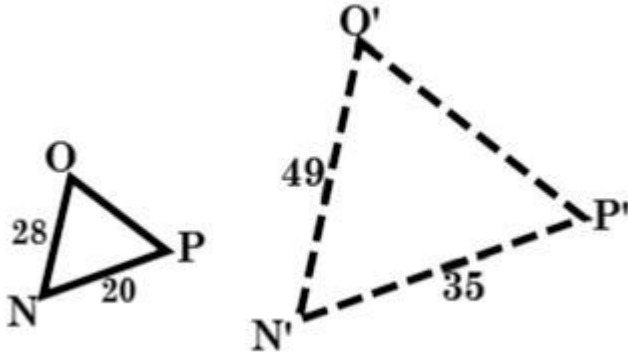
ID: 294514 — Standard: GSE G-SRT.1b

2.  $\overline{AB}$  with length 2.4 cm is dilated with a scale factor of 3. What is the new length of  $\overline{AB}$  ?
- A. 0.8 cm
  - B. 2.4 cm
  - C. 5.4 cm
  - D. 7.2 cm

ID: 155238 — Standard: GSE G-SRT.1b

3. A right triangle with hypotenuse 5 units and one leg 4 units is dilated with a scale factor of 2. What is the length of the smallest side of the new triangle?
- A. 3 units
  - B. 6 units
  - C. 8 units
  - D. 10 units

4.



What is the scale factor of the dilation?

A.  $\frac{7}{4}$

B.  $\frac{4}{7}$

C.  $\frac{7}{5}$

D.  $\frac{5}{7}$

5.  $\triangle NOP$  has side lengths of 5 cm, 7 cm, and 9 cm. If  $\triangle NOP \sim \triangle RST$ , which could be side lengths of  $\triangle RST$ ?

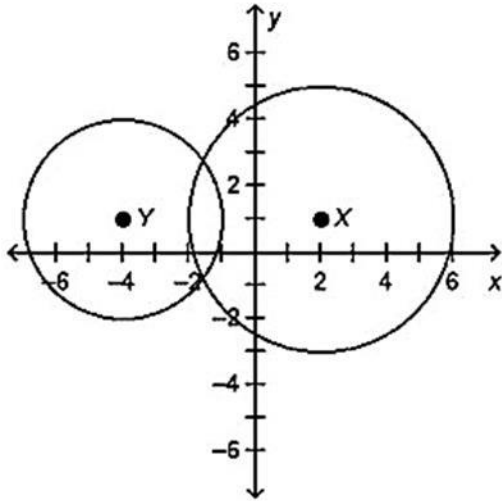
A. 1 cm, 3 cm, 5 cm

B. 6 cm, 8.4 cm, 13.5 cm

C. 7.5 cm, 10.5, 13.5 cm

D. 15 cm, 17 cm, 19 cm

6.

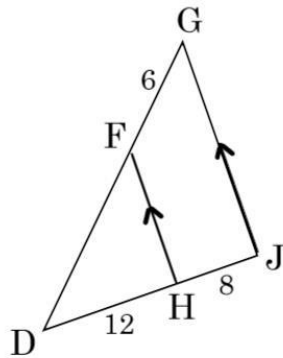


Use the figure to answer the question.

What scale factor could be used to dilate circle X to be congruent to circle Y?

- A.  $4/3$
- B.  $3/4$
- C.  $3/5$
- D.  $2/1$

7.

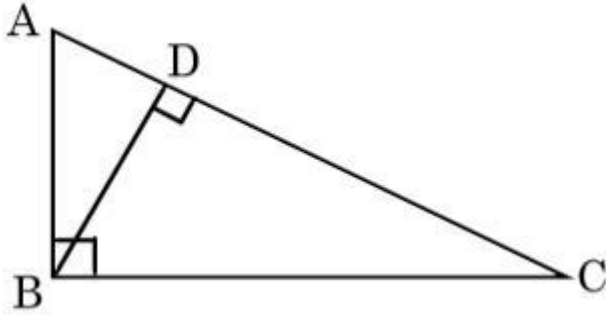


Use the figure to answer the question.

What is the length of segment  $DF$ ?

- A. 9
- B. 10
- C. 12
- D. 20

8.

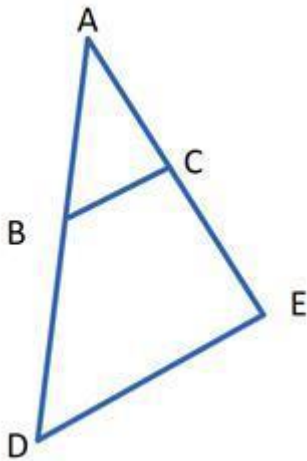


Select the 1 triangle that correctly completes the similarity statement?

$$\triangle ABC \sim \triangle \underline{\quad} ? \underline{\quad}$$

- A.  $\triangle ABD$
- B.  $\triangle ADB$
- C.  $\triangle BCD$
- D.  $\triangle BCA$

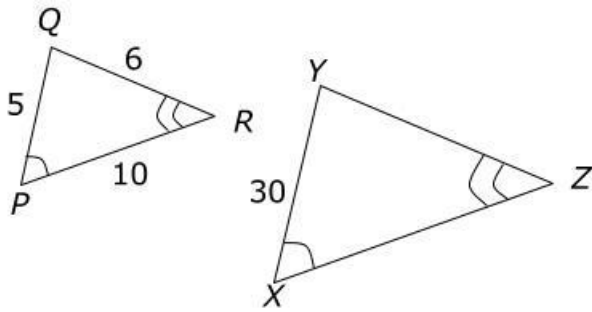
9.



Segment BC is a midsegment and triangle ADE. Find the length of BC if  $BC=2x+14$  and  $DE = 6x - 12$ .

- A. 7
- B. 20
- C. 28
- D. 54

10.

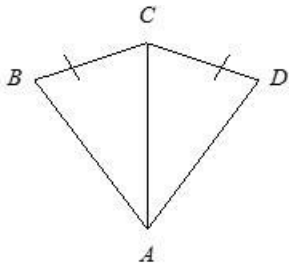


Given:  $\Delta PQR \sim \Delta XYZ$ .

What is the perimeter of  $\Delta XYZ$ ?

- A. 21
- B. 63
- C. 105
- D. 126

11.

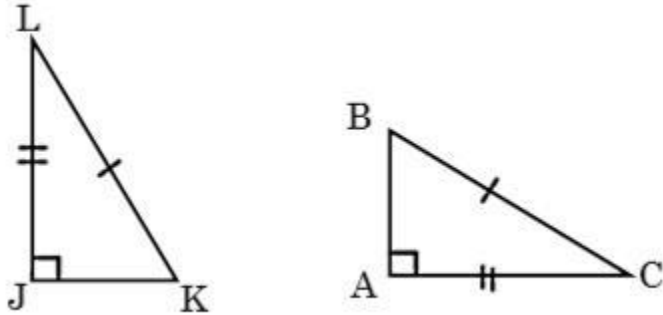


Use the figure to answer the question.

What additional information do you need to prove the two triangles are congruent by the SAS Postulate?

- A.  $\overline{AB} \cong \overline{AD}$
- B.  $\angle ABC \cong \angle ACD$
- C.  $\angle BCA \cong \angle DCA$
- D.  $\overline{BC} \cong \overline{DC}$

12.



Use the figure to answer the question.

Which statement is **TRUE**?

- A.  $\triangle ABC \cong \triangle JLK$  ; HL
- B.  $\triangle ABC \cong \triangle JKL$  ; HL
- C.  $\triangle ABC \cong \triangle JLK$  ; SAS
- D.  $\triangle ABC \cong \triangle JKL$  ; SSS

13. Heather is 1.6 meters tall and casts a shadow of 3.5 meters. A barn nearby casts a shadow of 17.5 meters.

What is the height of the barn?

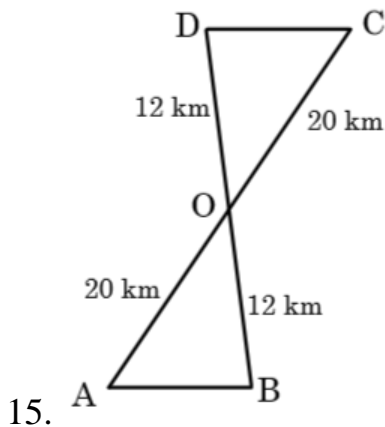
- A. 5 meters
- B. 8 meters
- C. 14 meters
- D. 38 meters

14. Given:

A (3,1), B (4,5), C (2,3),  
 D (-1, -3), E (-5, -4), F (-3, -2)

Which statement proves  $\triangle ABC$  maps onto  $\triangle DEF$ ?

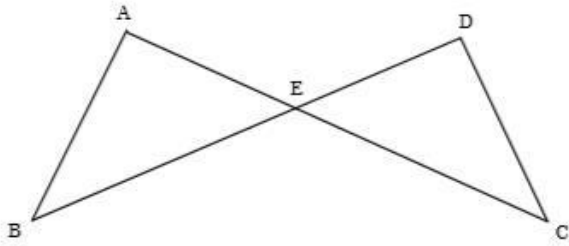
- A. Rotation:  $(x,y) \rightarrow (y, -x)$ , followed by a Reflection:  $(x, y) \rightarrow (x, -y)$ .
- B. Reflection:  $(x,y) \rightarrow (-x, y)$ , followed by a Rotation:  $(x, y) \rightarrow (y, -x)$ .
- C. Translation:  $(x,y) \rightarrow (x - 4, y)$ , followed by a Translation:  $(x, y) \rightarrow (x, y - 6)$ .
- D. Rotation:  $(x,y) \rightarrow (-y, x)$ , followed by a Reflection:  $(x, y) \rightarrow (x, -y)$ .



A pilot uses triangles to find the angle of elevation,  $\angle A$ , from the ground to her plane. If  $m\angle C = 40^\circ$ , how can she find  $m\angle A$ ?

- A.  $\triangle ABO \cong \triangle CDO$  by SAS and  $\angle A \cong \angle C$  by CPCTC, so  $m\angle A = 40^\circ$  by substitution.
- B.  $\triangle ABO \cong \triangle CDO$  by CPCTC and  $\angle A \cong \angle C$  by SAS, so  $m\angle A = 40^\circ$  by substitution.
- C.  $\triangle ABO \cong \triangle CDO$  by ASA and  $\angle A \cong \angle C$  by CPCTC, so  $m\angle A = 40^\circ$  by substitution.
- D.  $\triangle ABO \cong \triangle CDO$  by CPCTC and  $\angle A \cong \angle C$  by ASA, so  $m\angle A = 40^\circ$  by substitution.

16.

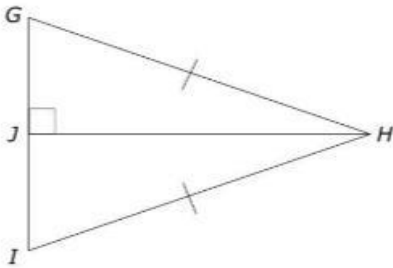


Point  $E$  is the midpoint of line segments  $AC$  and  $BD$ .

Which is the **TRUE** statement?

- A.  $\triangle ABE \cong \triangle CDE$  by ASA
- B.  $\triangle ABE \cong \triangle CDE$  by AAS
- C.  $\triangle ABE \cong \triangle CDE$  by SAS
- D.  $\triangle ABE \cong \triangle CDE$  by SSS

17.



Use the figure to answer the question.

Which is the **TRUE** statement?

- A.  $\triangle GJH \cong \triangle IJH$  by SAS
- B.  $\triangle GJH \cong \triangle IJH$  by HL
- C.  $\triangle GJH \cong \triangle IJH$  by SSS
- D.  $\triangle GJH \cong \triangle HJI$  by HL



18. Two lines intersect to form two pairs of vertical angles:  
 $\angle 1 = (20x + 7)^\circ$  and  $\angle 3 = (5x + 7y + 49)^\circ$  are vertical angles.  
 $\angle 2 = (3x - 2y + 30)^\circ$  and  $\angle 4$  are vertical angles.

What are the values of  $x$  and  $y$  and the measure of  $\angle 1$  and  $\angle 2$ ?

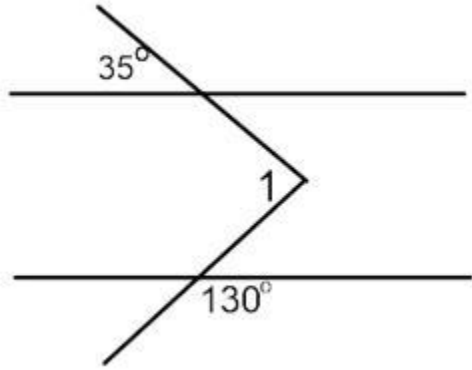
- A.  $x = 6$ ;  $y = 10$ ;  $m\angle 1 = 127^\circ$ ;  $m\angle 2 = 28^\circ$
- B.  $x = 8$ ;  $y = 11$ ;  $m\angle 1 = 167^\circ$ ;  $m\angle 2 = 13^\circ$
- C.  $x = 5$ ;  $y = 5$ ;  $m\angle 1 = 107^\circ$ ;  $m\angle 2 = 73^\circ$
- D.  $x = 7$ ;  $y = 9$ ;  $m\angle 1 = 147^\circ$ ;  $m\angle 2 = 33^\circ$

19. For two parallel lines and a transversal,  $\angle 1$  and  $\angle 2$  are same-side interior angles,  $\angle 2$  and  $\angle 3$  are vertical angles,  $\angle 3$  and  $\angle 4$  are alternate exterior angles.

Which classification best describes the relationship between  $\angle 2$  and  $\angle 4$ ?

- A. Adjacent
- B. Corresponding
- C. Alternate interior
- D. Vertical

20.

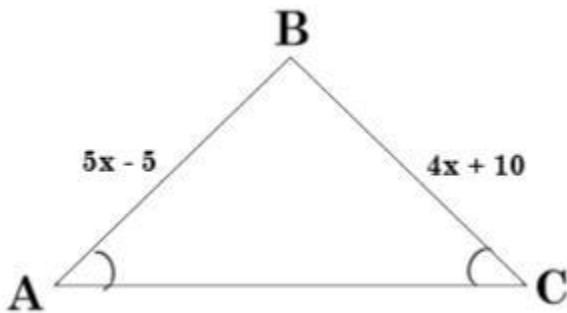


Use the figure to answer the question.

What is  $m\angle 1$ ? (*Hint: Draw a line parallel to the given parallel lines.*)

- A.  $m\angle 1 = 95^\circ$
- B.  $m\angle 1 = 80^\circ$
- C.  $m\angle 1 = 85^\circ$
- D.  $m\angle 1 = 75^\circ$

21.

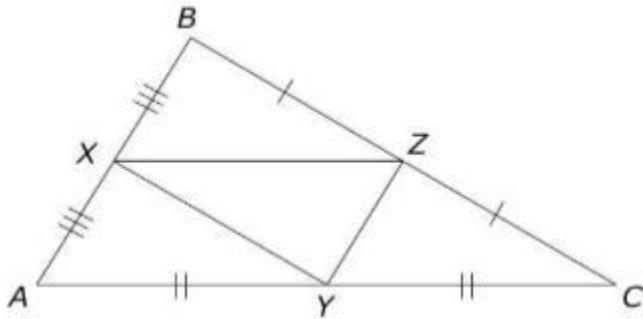


Use the figure to answer the question.

What is the length of AB?

- A. 5
- B. 15
- C. 30
- D. 70

22.

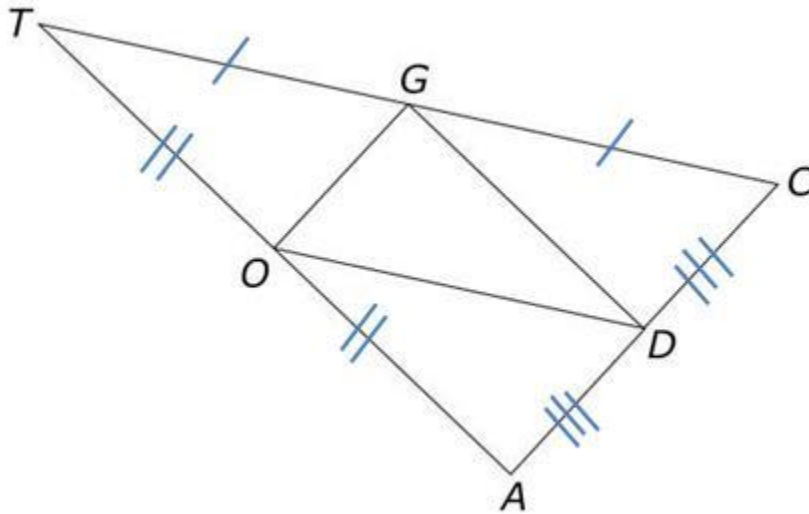


Given:  $BC = 3x - 1$  and  $XY = 2x - 3$ .

What is the length of  $XY$ ?

- A. 5 units
- B. 7 units
- C. 14 units
- D. 28 units

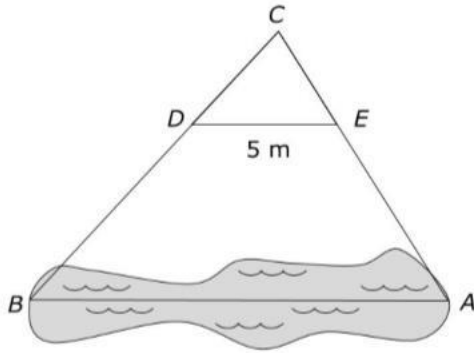
23.



If  $AD=5$ ,  $AT = 18$ , and  $CT = 22$ , find the perimeter of  $\triangle DOG$ ?

- A. 25
- B. 33
- C. 40
- D. 50

24.

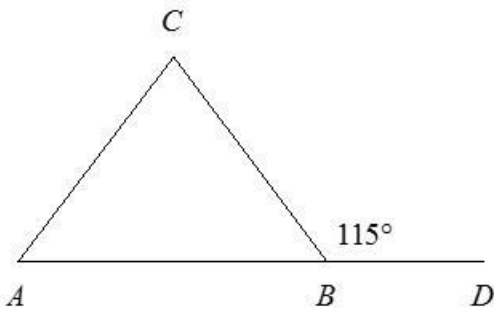


A surveyor locates points  $A$ ,  $B$ ,  $C$ ,  $D$ , and  $E$  of a pond. Triangle  $CDE$  is similar to Triangle  $CBA$ .  $CD=4$  and  $CB=12$ .

Using the lengths measured, what is the length of  $AB$  to the nearest meter?

- A. 10 meters
- B. 12 meters
- C. 15 meters
- D. 18 meters

25.

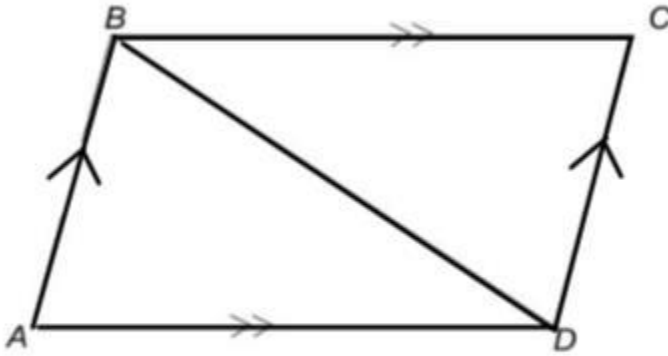


Two Galaxy systems, Tauri and M77, represented by points  $A$  and  $B$ , are equidistant from Earth, represented by point  $C$ .

What is  $m\angle A$ ?

- A.  $65^\circ$
- B.  $115^\circ$
- C.  $50^\circ$
- D.  $77^\circ$

26.



Statements	Reasons
1. $AB \parallel DC; AD \parallel BC$	Definition of Parallelogram
2. $\angle ADB \cong \angle CBD$	

Given: ABCD is a parallelogram.

Prove:  $\angle A \cong \angle C$ ;  $\angle B \cong \angle D$

What is the reason for Step 2 in this incomplete proof?

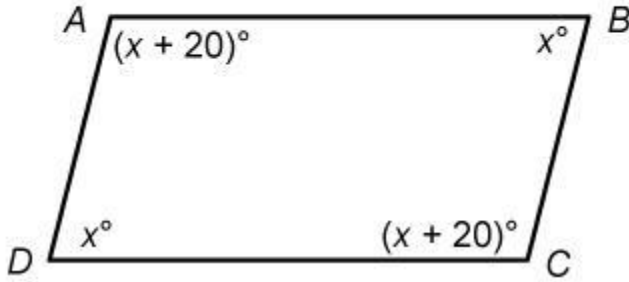
- A. Definition of parallelogram
- B. When parallel lines are cut by a transversal, alternate interior angles are congruent.
- C. When parallel lines are cut by a transversal, corresponding angles are congruent.
- D. Corresponding parts of congruent triangles are congruent.

27. Given quadrilateral  $ABCD$  with  $\overline{AB} \cong \overline{CD}$ ;  $\overline{BC} \cong \overline{DA}$ ;  $\overline{AC} \cong \overline{BD}$ .

Which of the following is correct concerning quadrilateral ABCD?

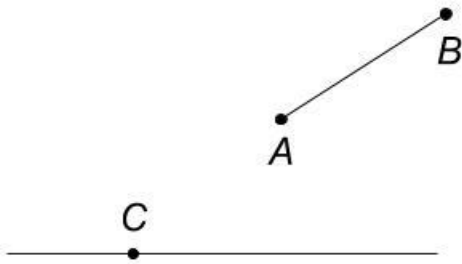
- A. Opposite sides are congruent, so ABCD is a parallelogram.  
Diagonals are congruent, so ABCD is a rectangle.  
Two consecutive sides are not necessarily congruent, so ABCD is NOT a square.
- B. Opposite sides are congruent, so ABCD is a rhombus.  
Diagonals are congruent, so ABCD is a rectangle.  
A quadrilateral that is a rhombus and a rectangle is a square, so ABCD is a square.
- C. Opposite sides are congruent, so ABCD is a parallelogram.  
Diagonals are congruent, so ABCD is a rhombus.  
One angle is not a right angle, so ABCD is NOT a square.
- D. The conclusion is valid without any more information needed. ABCD is a square.

28. In quadrilateral  $ABCD$ ,  $AB = DC$  and  $AD = BC$ . Find the  $m\angle D$ .



- A.  $180^\circ$
- B.  $80^\circ$
- C.  $40^\circ$
- D.  $100^\circ$

29.



Use the figure to answer the question.

Thinking Constructions: What is the first step to copy  $AB$  onto the line?

- A. Use a straightedge to draw  $AB$  so it intersects the other line.
- B. Open a compass to the distance of  $AB$ .
- C. Use a ruler to measure  $AB$ .
- D. Use a straightedge to draw  $AB$ .

30.

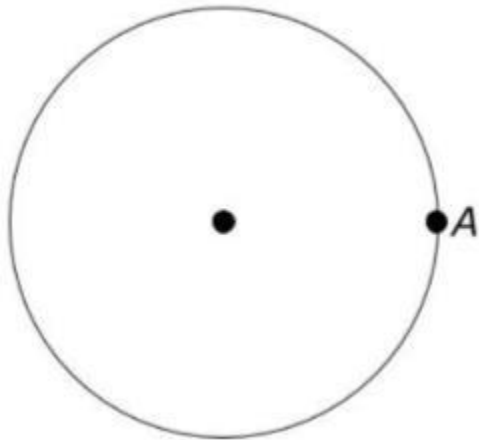


Use the figure to answer the question.

Which step should be first to construct a line perpendicular to  $HJ$  at point  $J$ ?

- A. Place the compass on point  $H$  and set its width to less than  $HJ$ . Then draw two arcs on both sides of  $H$ .
- B. Place the compass on point  $J$  and set its width to less than  $HJ$ . Then draw two arcs on both sides of  $J$ .
- C. Place the compass on point  $J$  and set its width to less than  $HI$ . Then draw a circle that will intersect the segment in two places.
- D. Place the compass on point  $J$  and set its width to more than  $JI$ . Then draw a circle around the segment  $HI$ .

31.



Use the figure to answer the question.

What is the first step when inscribing a regular hexagon in the circle?

- A. Set the compass to any distance. Then place the point of the compass at  $A$  and draw an arc that passes through any point on the circle.
- B. Place the point of the compass at any point on the circle and draw an arc that passes through point  $A$ .
- C. Open the compass to the radius of the circle.
- D. Draw the diameter of the circle.

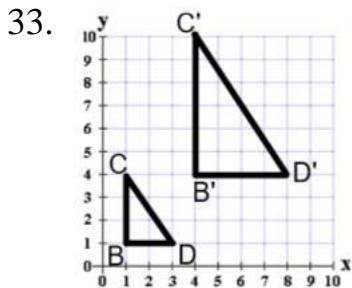
32. Given  $\triangle PQR \cong \triangle XYZ$ , which statement is **NOT** true?

A.  $\overline{PR} \cong \overline{XZ}$

B.  $\overline{YZ} \cong \overline{QR}$

C.  $\overline{RQ} \cong \overline{ZX}$

D.  $\overline{ZY} \cong \overline{RQ}$



Triangle BCD has been dilated to create triangle B'C'D'.

Part A. What is the scale factor that created  $\triangle B'C'D'$ ?

Part B. What is the similarity ratio of the areas from the pre-image to the image?

**(NOTE:** Your teacher will score your response to this question using a 2 point rubric.)