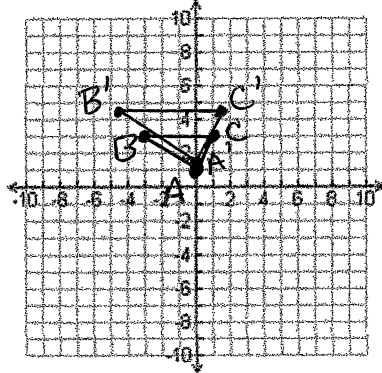


1. Draw a triangle with vertices at  $A(0, 1)$ ,  $B(-3, 3)$ , and  $C(1, 3)$ . Dilate the triangle using a scale factor of 1.5 and a center of  $(0, 0)$ . Sketch and name the dilated triangle  $A'B'C'$ .



$$A(0, 1) \rightarrow A'(0, 1.5)$$

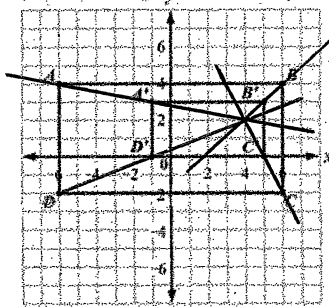
$$B(-3, 3) \rightarrow B'(-4.5, 4.5)$$

$$C(1, 3) \rightarrow C'(1.5, 4.5)$$

2. Line segment  $\overline{CD}$  is 5 inches long. If line segment  $\overline{CD}$  is dilated to form line segment  $\overline{C'D'}$  with a scale factor of 0.6, what is the length of line segment  $\overline{C'D'}$ ?

$$5 \times 0.6 = 3 \text{ inches}$$

3. Figure  $A'B'C'D'$  is a dilation of figure  $ABCD$ .



a. Determine the center of dilation.  $(4, 2)$

b. Determine the scale factor of the dilation.  $\frac{1}{2}$

c. What is the relationship between the sides of the pre-image and the corresponding sides of the image?

the sides are parallel

4. Which transformation results in a figure that is similar to the original figure but has a greater area?

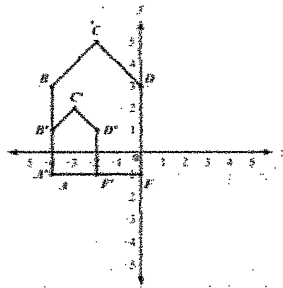
A. a dilation of  $\triangle QRS$  by a scale factor of 0.25

B. a dilation of  $\triangle QRS$  by a scale factor of 0.5

C. a dilation of  $\triangle QRS$  by a scale factor of 1

**D.** a dilation of  $\triangle QRS$  by a scale factor of 2

5. Figure  $A'B'C'D'F'$  is a dilation of figure  $ABCDF$  by a scale factor of  $\frac{1}{2}$ . The dilation is centered at  $(-4, -1)$ .



Which statement is true?

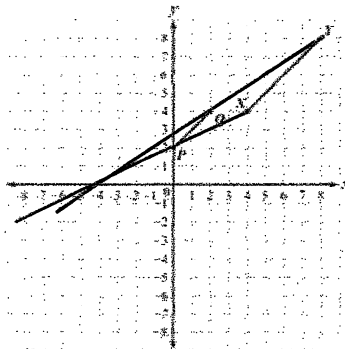
A.  $\frac{AB}{A'B'} = \frac{B'C'}{BC}$

**B.  $\frac{AB}{A'B'} = \frac{BC}{B'C'}$**

C.  $\frac{AB}{A'B'} = \frac{BC}{D'F'}$

D.  $\frac{AB}{A'B'} = \frac{D'F'}{BC}$

6. In the coordinate plane, segment  $\overline{PQ}$  is the result of a dilation of segment  $\overline{XY}$  by a scale factor of  $\frac{1}{2}$ .



Which point is the center of dilation?

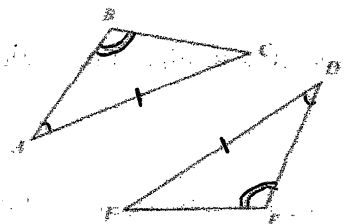
**A.  $(-4, 0)$**

B.  $(0, -4)$

C.  $(0, 4)$

D.  $(4, 0)$

7. Consider the triangles shown.



Which can be used to prove the triangles are congruent?

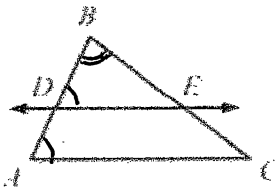
A. SSS

B. ASA

C. SAS

**D. AAS**

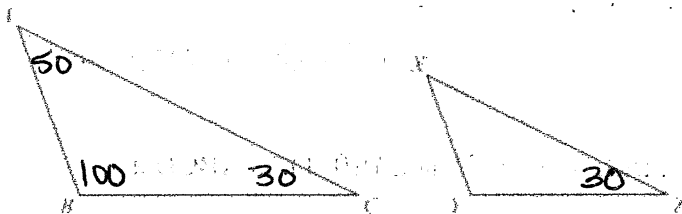
8. In the triangle shown,  $\overline{AC} \parallel \overline{DE}$ .



Prove that  $\overline{DE}$  divides  $\overline{AB}$  and  $\overline{CB}$  proportionally.  
Fill in the missing reasons.

Step	Statement	Justification
1	$\overline{AC} \parallel \overline{DE}$	Given
2	$\angle BDE \cong \angle BAC$	Corresponding angles
3	$\angle DBE \cong \angle ABC$	reflexive property
4	$\triangle DBE \sim \triangle ABC$	angle-angle (AA) similarity
5	$\frac{BA}{BD} = \frac{BC}{BE}$	Corresponding sides of similar triangles are proportional.
6	$BD + DA = BA$ $BE + EC = BC$	Segment Addition Postulate
7	$\frac{BD + DA}{BD} = \frac{BE + EC}{BE}$	Substitution property
8	$\frac{BD}{BD} + \frac{DA}{BD} = \frac{BE}{BE} + \frac{EC}{BE}$	Rewrite each fraction as a sum of two fractions.
9	$1 + \frac{DA}{BD} = 1 + \frac{EC}{BE}$	Simplify
10	$\frac{DA}{BD} = \frac{EC}{BE}$	subtraction property
11	$\overline{DE}$ divides $\overline{AB}$ and $\overline{CB}$ proportionally.	Definition of proportionality

9. In the triangles shown,  $\triangle ABC$  is dilated by a factor of  $\frac{2}{3}$  to form  $\triangle XYZ$ . Given that  $m\angle A = 50^\circ$  and  $m\angle B = 100^\circ$ , what is  $m\angle Z$ ?



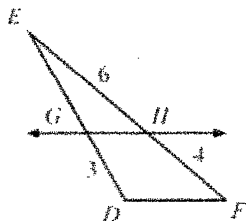
A.  $15^\circ$

B.  $25^\circ$

C.  $30^\circ$

D.  $50^\circ$

10. In the triangle shown,  $\overline{GH} \parallel \overline{DF}$ .



$$\frac{x}{3} = \frac{6}{4} \quad 4x = 18$$

What is the length of  $\overline{GE}$  ?

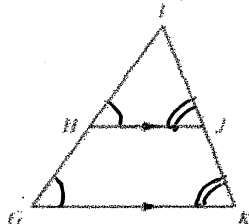
A. 2.0

**B. 4.5**

C. 7.5

D. 8.0

11. Use this triangle to answer the question.



This is a proof of the statement "If a line is parallel to one side of a triangle and intersects the other two sides at distinct points, then it separates these sides into segments of proportional lengths."

Step	Statement	Justification
1	$\overline{GK}$ is parallel to $\overline{HJ}$ .	Given
2	$\angle HGK \cong \angle HJH$ $\angle IKG \cong \angle IJH$	?
3	$\triangle GIK \sim \triangle HIJ$	AA Similarity
4	$\frac{IG}{IH} = \frac{IK}{IJ}$	Corresponding sides of similar triangles are proportional.
5	$\frac{HG + IH}{IH} = \frac{JK + IJ}{IJ}$	Segment Addition Postulate
6	$\frac{HG}{IH} = \frac{JK}{IJ}$	Subtraction Property of Equality

Which reason justifies Step 2?

A. Alternate interior angles are congruent.

B. Alternate exterior angles are congruent.

**C. Corresponding angles are congruent.**

D. Vertical angles are congruent.

12. Quadrilateral ABCD has vertices A(-1, 3), B(3, 5), C(4, 3), and D(0, 1). Is ABCD a rectangle? Explain how you know.

slopes

$$\overline{AB} = \frac{5-3}{3-(-1)} = \frac{2}{4} = \frac{1}{2}$$

$$\overline{BC} = \frac{3-5}{4-3} = \frac{-2}{1} = -2$$

$$\overline{CD} = \frac{1-3}{0-4} = \frac{-2}{-4} = \frac{1}{2}$$

$$\overline{AD} = \frac{1-3}{0-(-1)} = \frac{-2}{1} = -2$$

distance

$$\overline{AB} = \sqrt{2^2 + 4^2} = \sqrt{20}$$

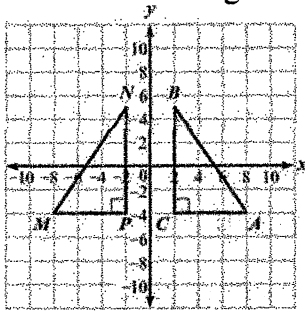
$$\overline{BC} = \sqrt{(-2)^2 + 1^2} = \sqrt{5}$$

$$\overline{CD} = \sqrt{(-2)^2 + (-4)^2} = \sqrt{20}$$

$$\overline{AD} = \sqrt{(-2)^2 + 1^2} = \sqrt{5}$$

yes. Opposite sides are congruent and parallel. consecutive sides are perpendicular.

13. Is  $\triangle ABC$  congruent to  $\triangle MNP$ ? Explain.



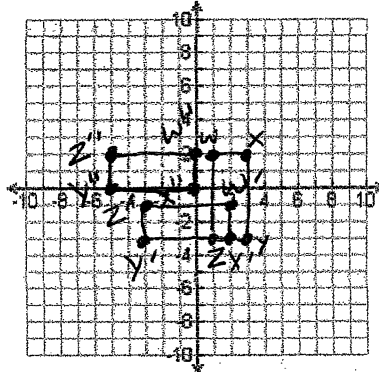
(scale unit = 2)

$\overline{AC} \cong \overline{MP}$   
 $\overline{BC} \cong \overline{NP}$   
 $\angle P \cong \angle C$   
 $\triangle ABC \cong \triangle MNP$  by SAS postulate

14. Rectangle WXYZ has coordinates W(1, 2), X(3, 2), Y(3, -3), and Z(1, -3).

a. Graph the image of rectangle WXYZ after a rotation of  $90^\circ$  clockwise about the origin. Label the image W'X'Y'Z'.

b. Translate rectangle W'X'Y'Z' 2 units left and 3 units up.

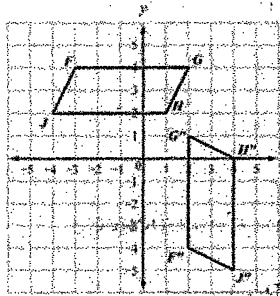


c. Is rectangle WXYZ congruent to rectangle W''X''Y''Z''? Explain.

yes. figures are same size and shape which is the definition of congruent.

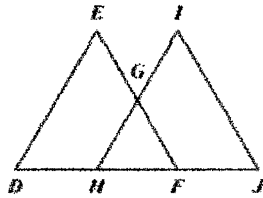
15. Parallelogram FGHIJ was translated 3 units down to form parallelogram F'G'H'I'J'. Parallelogram F'G'H'I'J' was then rotated  $90^\circ$  counterclockwise about point G' to obtain parallelogram F''G''H''I''J''.

Which statement is true about parallelogram FGHIJ and parallelogram F''G''H''I''J''?



- A. The figures are both similar and congruent.
- B. The figures are neither similar nor congruent.
- C. The figures are similar but not congruent.
- D. The figures are congruent but not similar.

16. In this diagram,  $DE \cong JI$  and  $\angle D \cong \angle J$ .



Which additional information is sufficient to prove that  $\triangle DEF$  is congruent to  $\triangle JIH$ ?

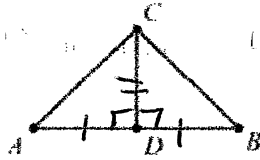
A.  $\overline{ED} \cong \overline{IH}$

**B.  $\overline{DH} \cong \overline{JF}$**

C.  $\overline{HG} \cong \overline{GI}$

D.  $\overline{HF} \cong \overline{JF}$

17. In this diagram,  $\overline{CD}$  is the perpendicular bisector of  $\overline{AB}$ . The two-column proof shows that  $\overline{AC}$  is congruent to  $\overline{BC}$ .



Which of the following would justify Step 6?

Step	Statement	Justification
1	$\overline{CD}$ is the perpendicular bisector of $\overline{AB}$ .	Given
2	$\overline{AD} \cong \overline{BD}$	Definition of bisector
3	$\overline{CD} \cong \overline{CD}$	Reflexive Property of Congruence
4	$\angle ADC$ and $\angle BDC$ are right angles.	Definition of perpendicular lines
5	$\angle ADC \cong \angle BDC$	All right angles are congruent.
6	$\triangle ADC \cong \triangle BDC$	_____ ? _____
7	$\overline{AC} \cong \overline{BC}$	CPCTC

A. AAS

B. ASA

**C. SAS**

D. SSS

18. In this diagram,  $STU$  is an isosceles triangle where  $\overline{ST}$  is congruent to  $\overline{UT}$ . The paragraph proof shows that  $\angle S$  is congruent to  $\angle U$ .



It is given that  $\overline{ST}$  is congruent to  $\overline{UT}$ . Draw  $\overline{TV}$  such that  $V$  is on  $\overline{SU}$  and  $\overline{TV}$  bisects  $\angle T$ . By the definition of an angle bisector,  $\angle STV$  is congruent to  $\angle UTV$ . By the Reflexive Property of Congruence,  $\overline{TV}$  is congruent to  $\overline{TV}$ . Triangle  $STV$  is congruent to triangle  $UTV$  by SAS.  $\angle S$  is congruent to  $\angle U$  by \_\_\_\_\_ ? \_\_\_\_\_.

Which step is missing in the proof?

**A. CPCTC**

B. Reflexive Property of Congruence

C. Definition of right angles

D. Angle Congruence Postulate