

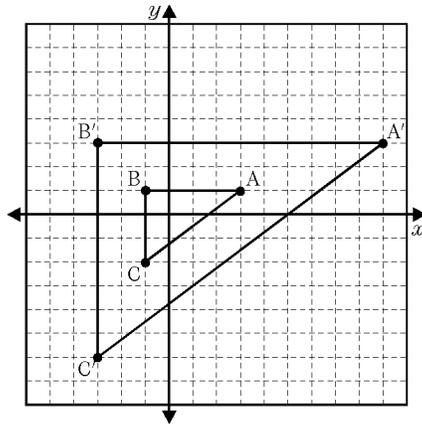
Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. What is the scale factor of the dilation that maps  $\triangle ABC \rightarrow \triangle A'B'C'$ ?

1. \_\_\_\_\_

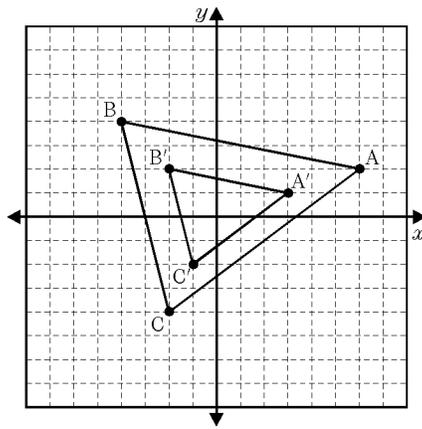
- A.  $\frac{1}{3}$     B. 2    C. 3    D. 6



2. What is the scale factor of the dilation that maps  $\triangle ABC \rightarrow \triangle A'B'C'$ ?

2. \_\_\_\_\_

- A.  $\frac{1}{2}$     B. 2    C. 4    D. 6



3. Which of the following statements *must* be true?

3. \_\_\_\_\_

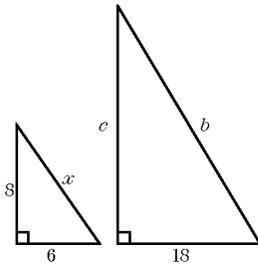
- I. If two triangles are similar they have the same shape.
- II. If two triangles are similar they have the same size.
- III. All equilateral triangles are similar.
- IV. All isosceles triangles are similar.

- A. I only            B. II only            C. I and II only    D. I and III only

4. Given the information in the diagram, do the triangles have to be similar?

4. \_\_\_\_\_

Hint: Do you have enough information to prove similarity? What theorem would you use?



- A. Yes. The right triangle is 3 times the size of the left triangle.
- B. Yes. All scalene triangles are similar
- C. No. Side  $c$  is not necessarily 24.
- D. No. Scalene triangles are never similar.

5. Which of these pairs of triangles must be similar?

5. \_\_\_\_\_

- A. two right triangles where the length of each hypotenuse is 5
- B. two isosceles triangles with two pairs of corresponding congruent sides
- C. two right triangles, one whose sides are 3, 4, and 5 and the other with sides 12, 16, and 20
- D. two triangles, one with sides  $2x$ ,  $3y$  and  $3z$ , and the other with sides  $2x$ ,  $y$ , and  $z$

6. If two right triangles each have a  $45^\circ$  angle, then the triangles must be—

6. \_\_\_\_\_

- A. similar
- B. congruent
- C. acute
- D. equilateral

7. If two scalene triangles have two congruent angles, then the triangles must be—

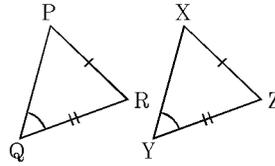
7. \_\_\_\_\_

Hint: Think back to the definition of similarity!

- A. acute
- B. right
- C. similar
- D. congruent

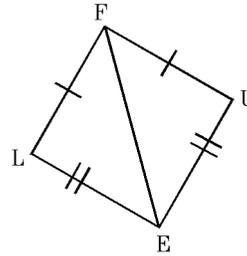
8. Are  $\triangle XYZ$  and  $\triangle PQR$  congruent? Which theorem would you use to prove it? 8. \_\_\_\_\_

- A. AAA      B. SSA      C. SAS  
 D. not necessarily congruent



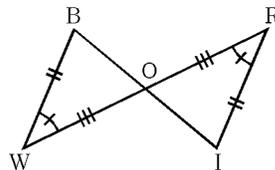
9. Can you prove  $\triangle FLE$  and  $\triangle FUE$  are congruent? Which theorem would you use? 9. \_\_\_\_\_

- A. ASA      B. SSA      C. SSS  
 D. not necessarily congruent



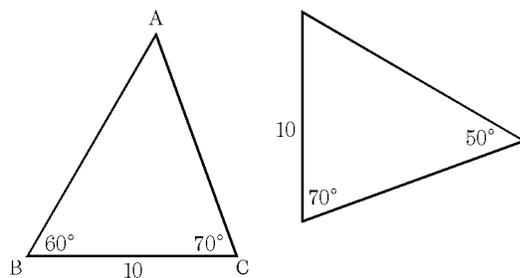
10. Given the markings in the picture, can you prove  $\triangle BWO$  and  $\triangle IRO$  are congruent? 10. \_\_\_\_\_

- A. ASA      B. AAA      C. SAS  
 D. not necessarily congruent



11. Using only the information given, are you able to prove the triangles are congruent? Which theorem would you use? 11. \_\_\_\_\_

Hint: Find the angles in each triangle first!



- A. ASA      B. SSS  
 C. SAS      D. cannot be proven congruent



15. Which congruency theorem is described below?

15. \_\_\_\_\_

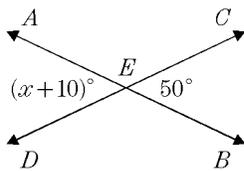
“In two triangles, if three pairs of sides are equal in length, then the triangles are congruent.”

- A. SSS                  B. SAS                  C. ASA                  D. AAA

16. In the accompanying diagram, lines  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  intersect at point  $E$ . If  $m\angle AED = (x + 10)$  and  $m\angle CEB = 50$ , find  $x$ .

16. \_\_\_\_\_

- a.  $x=60$   
b.  $x=40$   
c.  $x=120$   
d.  $x=160$



17. Which congruency theorem is described below?

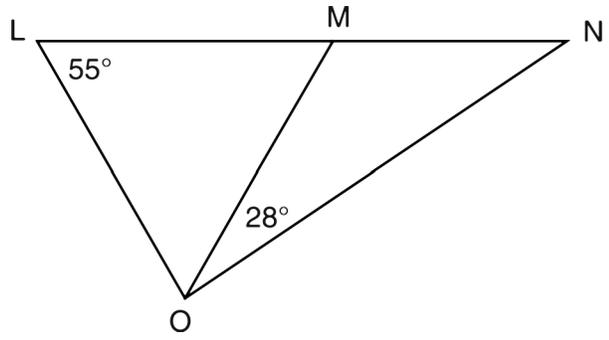
17. \_\_\_\_\_

“In two triangles, if two pairs of sides and their included angles(or the angle in between) have equal measurement, then the triangles are congruent.”

- A. SSS                  B. SAS                  C. ASA                  D. AAA

18. In the diagram below,  $\triangle LMO$  is isosceles with  $LO = MO$ .

18. \_\_\_\_\_



If  $m\angle L = 55$  and  $m\angle NOM = 28$ , what is  $m\angle N$ ?

Hint: Think of linear pairs!

- A. 27                      B. 28                      C. 42                      D. 70

19. Which statement is not valid for proving that two triangles are congruent?

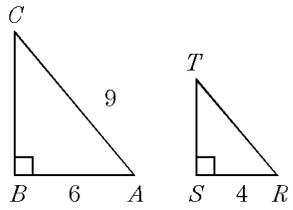
19. \_\_\_\_\_

- A.  $SAS \cong SAS$       B.  $SSA \cong SSA$       C.  $ASA \cong ASA$       D.  $AAS \cong AAS$

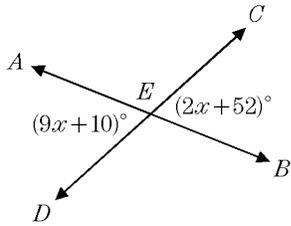
20. In the accompanying diagram, right triangle  $ABC$  is similar to right triangle  $RST$  with  $\angle A \cong \angle R$ . If  $AB = 6$ ,  $AC = 9$ , and  $RS = 4$ , find  $RT$ .

20. \_\_\_\_\_

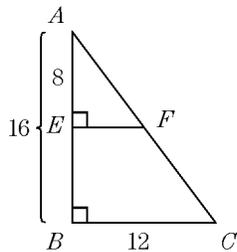
- a. 6  
b. 13.5  
c. 12  
d. 3



21. In the accompanying diagram,  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  intersect at  $E$ . If  $m\angle AED = 9x + 10$  and  $m\angle BEC = 2x + 52$ , find the value of  $x$ . 21. \_\_\_\_\_
- a. 6  
 b. 10.7  
 c. 2.55  
 d. 12



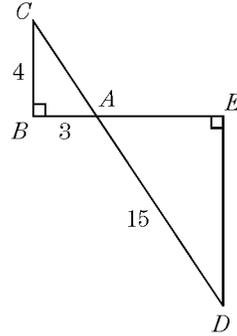
22. In the accompanying diagram of  $\triangle ABC$ , if  $BC = 12$ ,  $AB = 16$ ,  $AF = AC$  and  $AE = 8$ , find  $EF$ . 22. \_\_\_\_\_
- a. 24  
 b. 12  
 c. 6  
 d. 18



23. In the accompanying diagram,  $\overline{BAE}$ ,  $\overline{CAD}$ ,  $\angle B$  and  $\angle E$  are right angles,  $AB = 3$ ,  $BC = 4$ , and  $AD = 15$  and  $\angle CAB = \angle EAD$ . 23. \_\_\_\_\_

What is the length of  $DE$ ?

- A. 5      B. 8      C. 9      D. 12

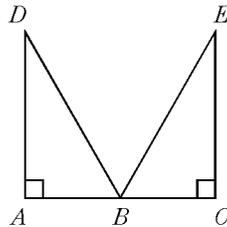


24. Two triangles are congruent if 24. \_\_\_\_\_

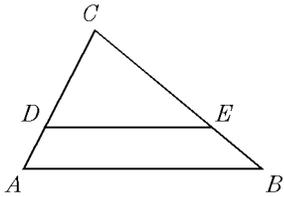
- A. corresponding angles are congruent  
 B. corresponding sides and corresponding angles are congruent  
 C. the angles in each triangle have a sum of  $180^\circ$   
 D. corresponding sides are proportional

25. In the accompanying diagram,  $B$  is the midpoint of  $\overline{AC}$ ,  $\overline{DA} \perp \overline{AC}$ ,  $\overline{EC} \perp \overline{AC}$ , and  $\overline{DB} \cong \overline{EB}$ . Which method of proof may be used to prove  $\triangle DAB \cong \triangle ECB$ ? 25. \_\_\_\_\_

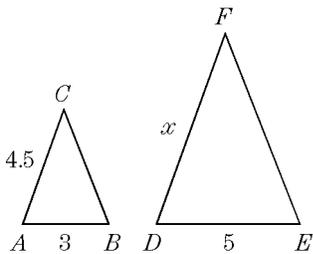
- A.  $SAS \cong SAS$       B.  $ASA \cong ASA$   
 C.  $HL \cong HL$       D.  $AAS \cong AAS$



26. In the accompanying diagram of  $\triangle ABC$ ,  $\overline{DE} \parallel \overline{AB}$ ,  $CA = 9$ ,  $DA = 3$ , and  $CE = 10$ . Find  $EB$ . 26. \_\_\_\_\_
- a. 2  
 b. 3.33  
 c. 6.66  
 d. 5

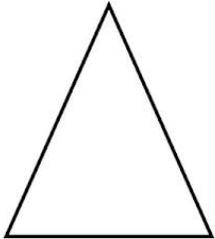


27. In the accompanying diagram,  $\triangle ABC$  is similar to  $\triangle DEF$  with  $\angle A \cong \angle D$  and  $\angle B \cong \angle E$ . If  $AC = 4.5$ ,  $AB=3$ ,  $DF = x$ , and  $DE = 5$ , find the value of  $x$ . 27. \_\_\_\_\_
- a.  $x=7$   
 b.  $x=3.33$   
 c.  $x=9$   
 d.  $x=7.5$



28. In isosceles triangle  $RST$ ,  $RS=ST$  and  $\angle S=76$  Find  $\angle R$ .

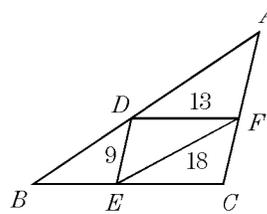
- a. 28 degrees
- b. 76 degrees
- c. 52 degrees
- d. 25 degrees



28. \_\_\_\_\_

29. In the accompanying diagram of  $\triangle ABC$ ,  $\triangle DEF$  is formed by joining the midpoints of the sides of  $\triangle ABC$ . If  $DE = 9$ ,  $FE = 18$ , and  $DF = 13$ , what is the perimeter of  $\triangle ABC$ ?

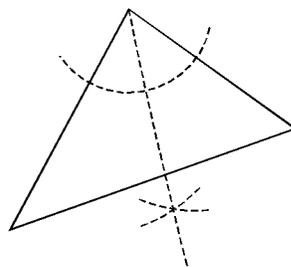
- A. 10
- B. 20
- C. 40
- D. 80



29. \_\_\_\_\_

30. Using the diagram, identify the dashed line segment.

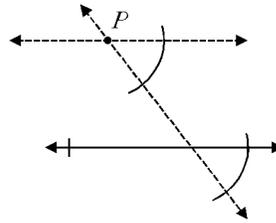
- A. median
- B. altitude
- C. angle bisector
- D. perpendicular bisector



30. \_\_\_\_\_

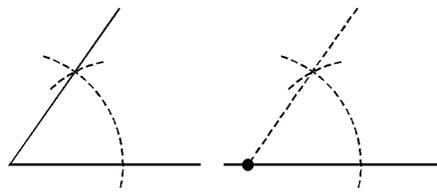
31. The drawing shows how to—

- A. construct a parallel line through a given point
- B. draw a perpendicular bisector
- C. copy a segment
- D. bisect an angle



31. \_\_\_\_\_

32. The drawing shows how to—



- A. construct an angle congruent to a given angle
- B. construct an equilateral triangle
- C. draw an angle bisector
- D. draw a perpendicular line through a point on a line

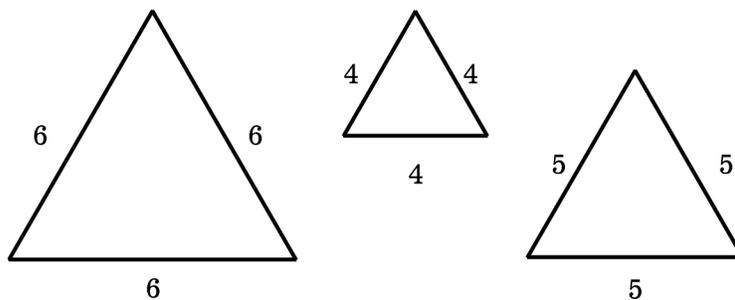
32. \_\_\_\_\_

33. If two triangles are similar, are they always congruent? Explain your answer.

33. \_\_\_\_\_

34. Examine the following three equilateral triangles.

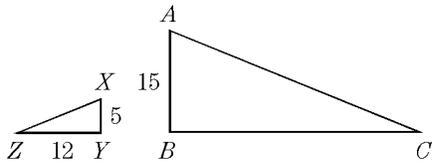
34. \_\_\_\_\_



- a) Are they each similar to one another? If so, which theorem would you use to prove similarity?

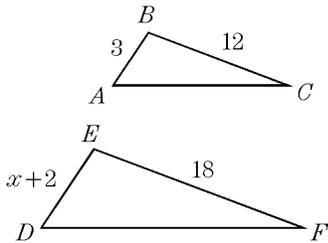
35. In the accompanying diagram of triangle  $XYZ$  and triangle  $ABC$ ,  $\angle X \cong \angle A$  and  $\angle Y \cong \angle B$ . If  $XY = 5$ ,  $YZ = 12$ , and  $AB = 15$ , what is  $BC$ ?

35. \_\_\_\_\_



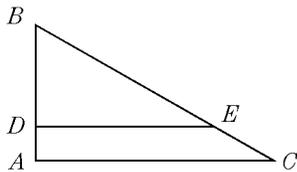
36. In the accompanying diagram,  $\triangle ABC$  is similar to  $\triangle DEF$ ,  $\angle A \cong \angle D$ , and  $\angle B \cong \angle E$ . If  $AB = 3$ ,  $BC = 12$ ,  $DE = x + 2$ , and  $EF = 18$ , find the value of  $x$ .

36. \_\_\_\_\_



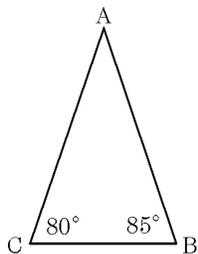
37. In the accompanying diagram of triangle  $ABC$ ,  $D$  is a point on  $\overline{AB}$  and  $E$  is a point on  $\overline{BC}$  such that  $\overline{DE} \parallel \overline{AC}$ . If  $AB = 8$ ,  $DB = 6$ , and  $BC = 16$ , find the length of  $\overline{BE}$ .

37. \_\_\_\_\_

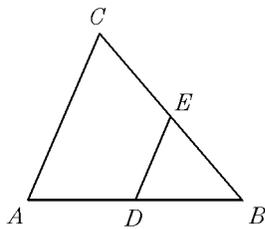


38. Based on the information given, can you prove  $AB \neq AC$ ? Why?

38. \_\_\_\_\_



39. In the accompanying diagram of  $\triangle ABC$ ,  $D$  is the midpoint of  $\overline{AB}$  and  $E$  is the midpoint of  $\overline{BC}$ . If  $DE = 5$  and  $AC = 2x - 20$ , find  $x$ . 39. \_\_\_\_\_

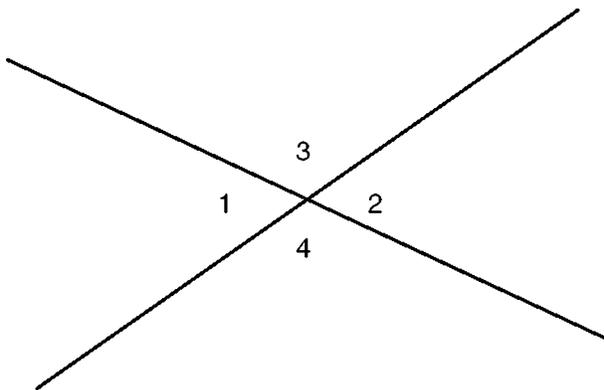


40. The measures of two complementary angles are represented by  $x + 5$  and  $4x - 15$ . Find the value of  $x$ . 40. \_\_\_\_\_

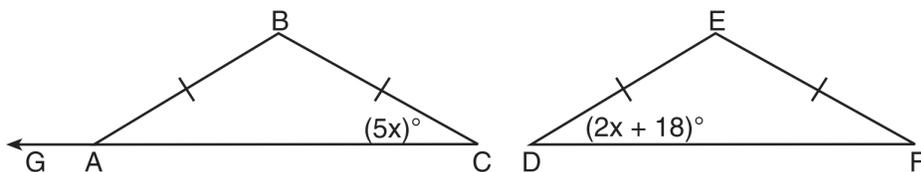
Think: What does complementary mean?

41. Two angles are supplementary. If one of these angles measures  $50^\circ$  more than the other, find the measure of the smaller angle. 41. \_\_\_\_\_

42. In the accompanying figure, two lines intersect,  $m\angle 3 = 6t + 30$ , and  $m\angle 2 = 8t - 60$ . Find the number of degrees in  $m\angle 4$ . 42. \_\_\_\_\_



43. In the accompanying diagram, isosceles  $\triangle ABC \cong$  isosceles  $\triangle DEF$ ,  $m\angle C = 5x$ , and  $m\angle D = 2x + 18$ . Find  $m\angle B$  and  $m\angle BAG$ . 43. \_\_\_\_\_



44. Prove:  $a^2 + b^2 = c^2$

44. \_\_\_\_\_

Finish the following proof.

