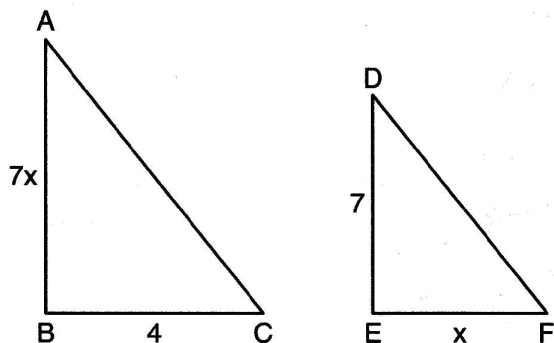
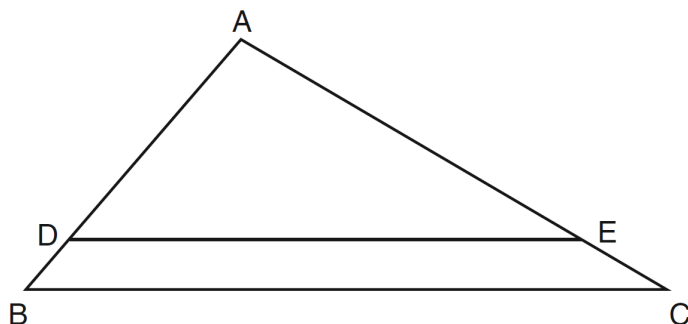


1. Base your answer to the following question on As shown in the diagram below,  $\triangle ABC \sim \triangle DEF$ ,  $AB = 7x$ ,  $BC = 4$ ,  $DE = 7$ , and  $EF = x$ .



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

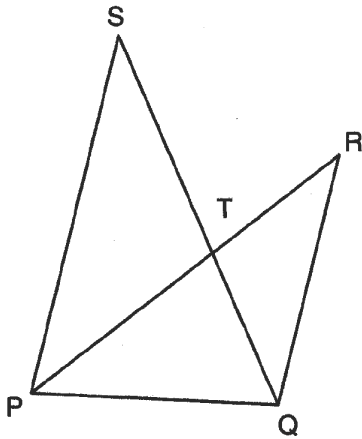
- (1) 28      (2) 4      (3) 2      **(4) 14**
2. In triangle  $ABC$  and  $DEF$ ,  $AB = 4$ ,  $AC = 5$ ,  $DE = 8$ ,  $DF = 10$ , and  $\angle A \cong \angle D$ . Which method could be used to prove  $\triangle ABC \sim \triangle DEF$ ?
- (1) SSS      (2) AA      **(3) SAS**      (4) ASA
3. The coordinates of the vertices of a triangle are (1,1), (3,1), and (3,5). The triangle formed is
- (1) an equilateral triangle      (2) an isosceles triangle  
**(3) a right triangle**      (4) an obtuse triangle
4. If two angles of one triangle are congruent to two angles of another triangle, then how *must the* triangles be described?
- (1) scalene      (2) isosceles      **(3) similar**      (4) congruent
5. In the diagram of  $\triangle ABC$  shown below,  $\overline{DE} \parallel \overline{BC}$ .



If  $AB = 10$ ,  $AD = 8$ , and  $AE = 12$ , what is the length of  $\overline{EC}$ ?

- (1) 6      (2) 2      **(3) 3**      (4) 15

6. In the diagram below,  $\overline{SQ}$  and  $\overline{PR}$  intersect at  $T$ ,  $\overline{PQ}$  is drawn, and  $\overline{PS} \parallel \overline{QR}$ .



Which technique can be used to prove  $\triangle PST \sim \triangle RQT$ ?

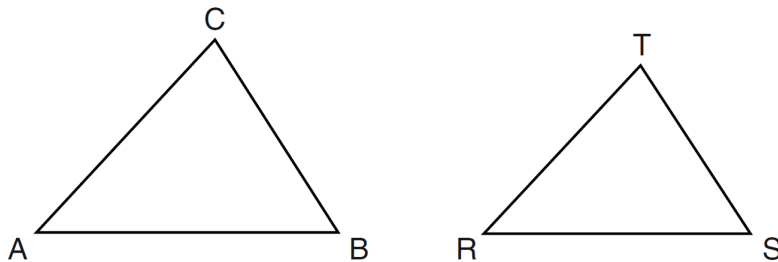
- (1) SSS      (2) AA      (3) ASA      (4) SAS

7. In right triangle  $ABC$ , angle  $C$  is the right angle.

If the coordinates of  $A$  are  $(-1,1)$  and the coordinates of  $B$  are  $(4,-2)$ , the coordinates of  $C$  may be

- (1)  $(-1,2)$       (2)  $(1,-2)$       (3)  $(-1,-2)$       (4)  $(1,2)$

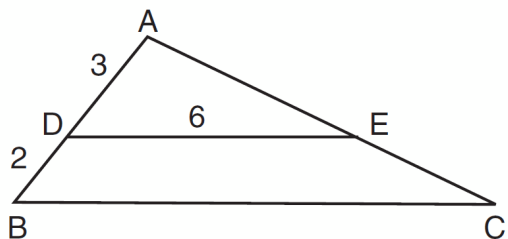
8. In the diagram below,  $\triangle ABC \sim \triangle RST$ .



Which statement is *not* true?

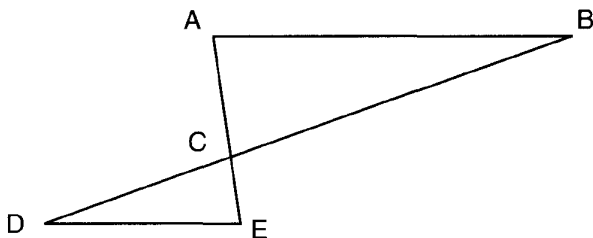
- (1)  $\angle A \cong \angle R$       (2)  $\frac{AB}{BC} = \frac{ST}{RS}$   
 (3)  $\frac{AB}{RS} = \frac{BC}{ST}$       (4)  $\frac{AB+BC+AC}{RS+ST+RT} = \frac{AB}{RS}$

9. In the diagram of  $\triangle ABC$  below,  $\overline{DE} \parallel \overline{BC}$ ,  $AD = 3$ ,  $DB = 2$ , and  $DE = 6$ .



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

- (1) 12                      (2) 10                      (3) 8                      (4) 4
10. Two triangles are similar, and the ratio of each pair of corresponding sides is 2 : 1. Which statement regarding the two triangles is *not* true?
- (1) Their perimeters have a ratio of 2 : 1.  
(2) Their altitudes have a ratio of 2 : 1.  
(3) Their areas have a ratio of 4 : 1.  
**(4) Their corresponding angles have a ratio of 2 : 1.**
11. In the diagram of  $\triangle ABC$  and  $\triangle EDC$  below,  $\overline{AE}$  and  $\overline{BD}$  intersect at  $C$ , and  $\angle CAB \cong \angle CED$ .



Which method can be used to show that  $\triangle ABC$  *must be similar* to  $\triangle EDC$ ?

- (1) HL                      (2) SSS                      (3) AA                      (4) SAS
12. In  $\triangle ABC$  and  $\triangle DEF$ ,  $\frac{AC}{DF} = \frac{CB}{FE}$ . Which additional information would prove  $\triangle ABC \sim \triangle DEF$ ?
- (1)  $AC = DF$     (2)  $CB = FE$   
(3)  $\angle BAC \cong \angle EDF$     (4)  $\angle ACB \cong \angle DFE$
13. The vertices of rectangle  $ABCD$  are  $A(3,1)$ ,  $B(-5,1)$ ,  $C(-5,-3)$ , and  $D$ . What are the coordinates of  $D$ ?
- (1) **(3,-3)**                      (2)  $(-3,-3)$                       (3)  $(3,3)$                       (4)  $(-3,3)$

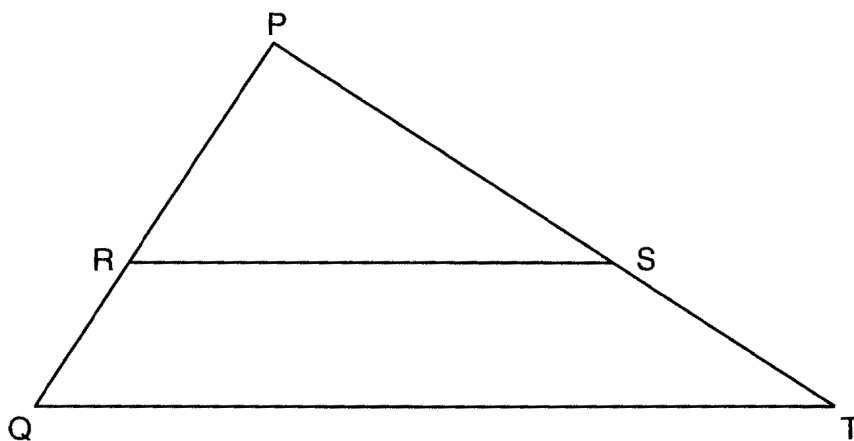
14. When two parallel lines are cut by a transversal, which angles are *not* always congruent?

- (1) a pair of alternate interior angles
- (2) a pair of alternate exterior angles
- (3) two corresponding angles
- (4) two interior angles on the same side of the transversal**

15. Triangle  $ABC$  is similar to triangle  $DEF$ . The lengths of the sides of  $\triangle ABC$  are 5, 8, and 11. What is the length of the shortest side of  $\triangle DEF$  if its perimeter is 60?

- (1) 10
- (2) 12.5**
- (3) 20
- (4) 27.5

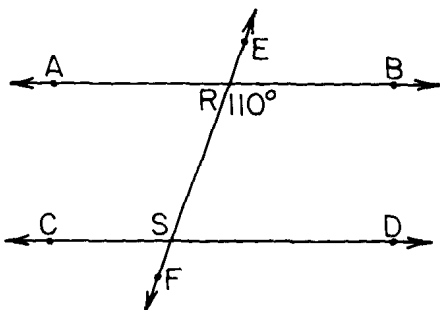
16. Triangle  $PQT$  with  $\overline{RS} \parallel \overline{QT}$  is shown below.



If  $PR = 12$ ,  $RQ = 8$ ,  $PS = 21$ , what is the length of  $\overline{PT}$ ?

- (1) 14
- (2) 17
- (3) 35**
- (4) 38

17. In the accompanying diagram, parallel lines  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  are intersected by transversal  $\overleftrightarrow{EF}$  at R and S, respectively. If  $m\angle BRS = 110$ , find  $m\angle RSD$ .

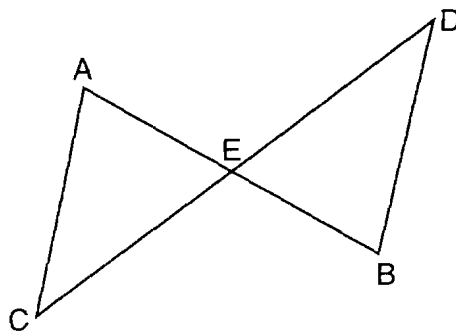


- (1) 85
- (2) 65
- (3) 110
- (4) 70**

18. In  $\triangle ABC$ , point  $D$  is on  $\overline{AB}$ , and point  $E$  is on  $\overline{BC}$  such that  $\overline{DE} \parallel \overline{AC}$ . If  $DB = 2$ ,  $DA = 7$ , and  $DE = 3$ , what is the length of  $\overline{AC}$ ?

(1) 8                      (2) **13.5**                      (3) 10.5                      (4) 9

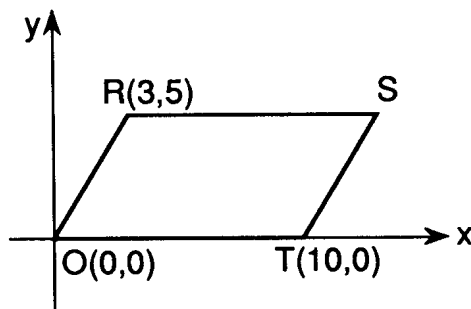
19. Base your answer to the following question on In the accompanying diagram,  $E$  is the midpoint of  $\overline{AB}$  and  $\overline{CD}$ .



Triangle  $AEC$  can be proved congruent to triangle  $BED$  by

(1)  $ASA \cong ASA$                       (2)  **$SAS \cong SAS$**   
 (3)  $SSS \cong SSS$                       (4)  $AAS \cong AAS$

20. Base your answer to the following question on In the accompanying diagram of parallelogram  $ORST$ , the coordinates of vertices  $O$ ,  $R$ , and  $T$  are  $(0,0)$ ,  $(3,5)$ , and  $(10,0)$ , respectively.



What are the coordinates of vertex  $S$ ?

(1)  $(10,5)$                       (2)  $(7,5)$                       (3)  $(13,0)$                       (4)  **$(13,5)$**

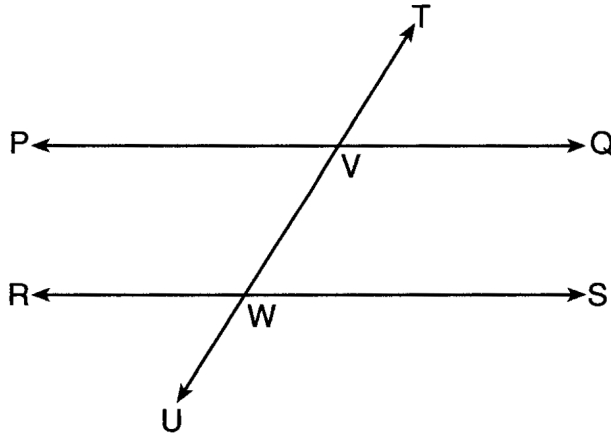
21. What is the length of a line segment whose endpoints have coordinates  $(5,3)$  and  $(1,6)$ ?

(1) **5**                      (2) 25                      (3)  $\sqrt{17}$                       (4)  $\sqrt{29}$

22. The endpoints of  $\overline{CD}$  are  $C(-2,4)$  and  $D(6,2)$ . What are the coordinates of the midpoint of  $\overline{CD}$ ?

(1)  $(4, 3)$                       (2)  $(4, -2)$                       (3)  **$(2, 3)$**                       (4)  $(2, -1)$

23. In the diagram below, transversal  $\overleftrightarrow{TU}$  intersects  $\overleftrightarrow{PQ}$  and  $\overleftrightarrow{RS}$  at  $V$  and  $W$ , respectively.



If  $m\angle TVQ = 5x - 22$  and  $m\angle VWS = 3x + 10$ , for which value of  $x$  is  $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$ ?

- (1) 6                      (2) **16**                      (3) 24                      (4) 28

24. When a quadrilateral is reflected over the line  $y = x$ , which geometric relationship is *not* preserved?

- (1) congruence                      (2) perpendicularity  
(3) parallelism                      (4) **orientation**