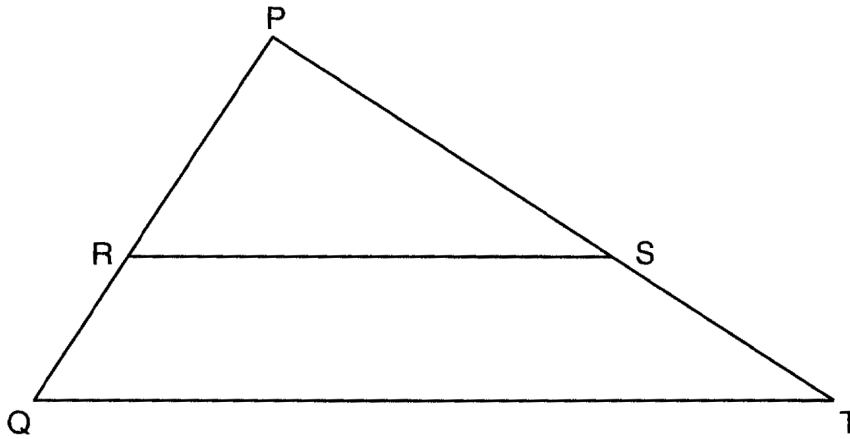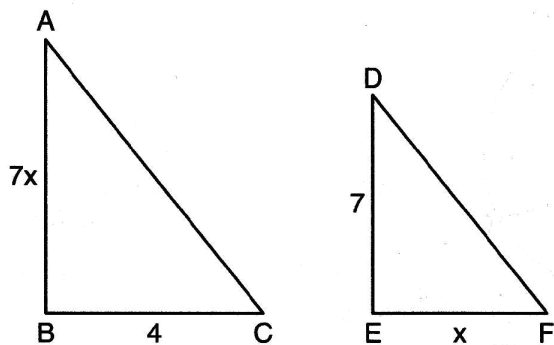1. Triangle *PQT* with $\overline{RS} \parallel \overline{QT}$ is shown below.
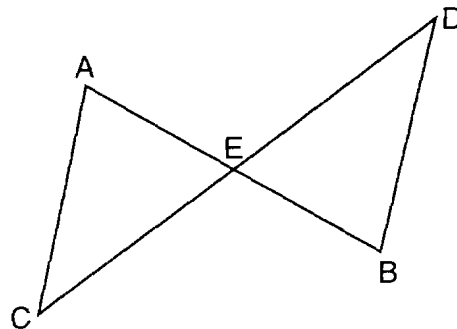

If *PR* = 12, *RQ* = 8, *PS* = 21, what is the length of $\overline{PT}$?

2. 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 $\overline{AB}$?

3. 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) $AAS \cong AAS$

4. 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

5. 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

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

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

7. In the diagram of $\triangle ABC$ *shown below,* $\overline{DE} \parallel \overline{BC}$.
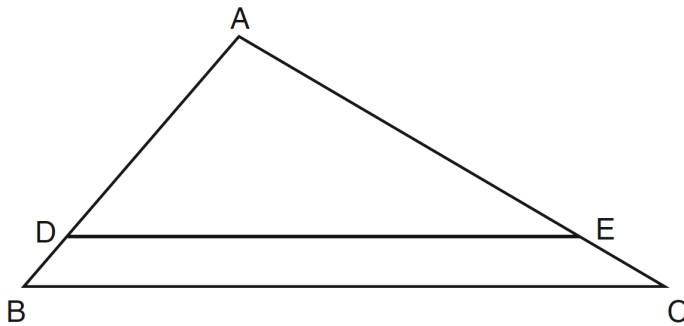
If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of $\overline{EC}$?

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

8. In the diagram below, transversal $\overleftrightarrow{TU}$ intersects $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ at V and W, respectively.
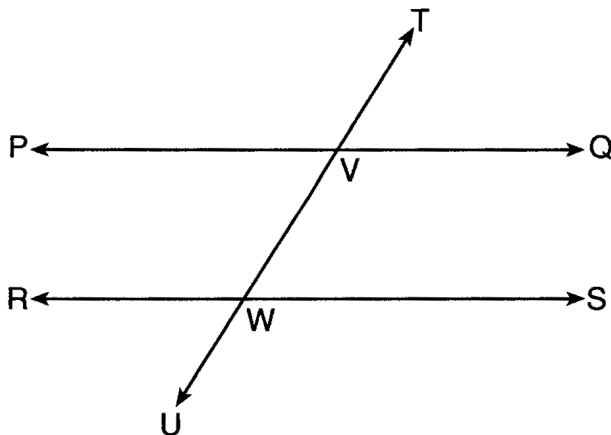
If $\mathrm{m}\angle TVQ = 5x - 22$ and $\mathrm{m}\angle VWS = 3x + 10$. for which value of x is $\overleftrightarrow{PQ} \parallel \overleftrightarrow{RS}$?

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

9. 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

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. 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

12. 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)

13. In the accompanying diagram, parallel lines $\overleftarrow{AB}$ and $\overleftarrow{CD}$ are intersected by transversal $\overleftarrow{EF}$ at *R* and *S*, respectively. If m∠*BRS* = 110, find m∠*RSD*.
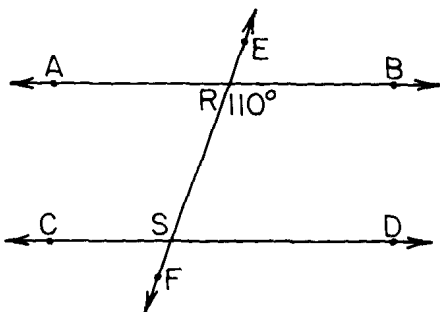
    (1) 85   (2) 65   (3) 110   (4) 70

14. 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)

15. In triangle *ABC* and *DEF*, *AB* = 4, *AC* = 5, *DE* = 8, *DF* = 10, and ∠*A* ≅ ∠*D*. Which method could be used to prove $\triangle ABC \sim \triangle DEF$?

    (1) SSS   (2) AA   (3) SAS   (4) ASA
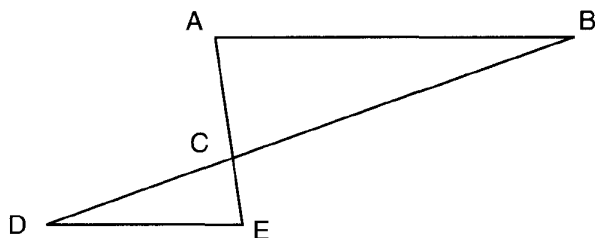
16. What is the length of a line segment whose endpoints have coordinates (5,3) and (1,6)?

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

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

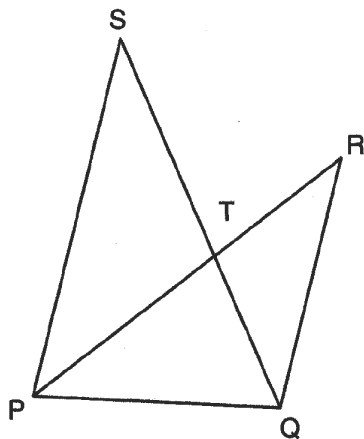   (1) 8   (2) 13.5   (3) 10.5   (4) 9

18. 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

19. 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

20. 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) $CB = FE$
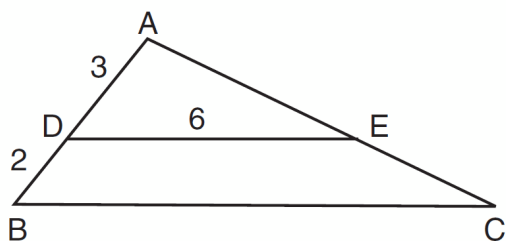   (3) $\angle BAC \cong \angle EDF$ (4) $\angle ACB \cong \angle DFE$

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

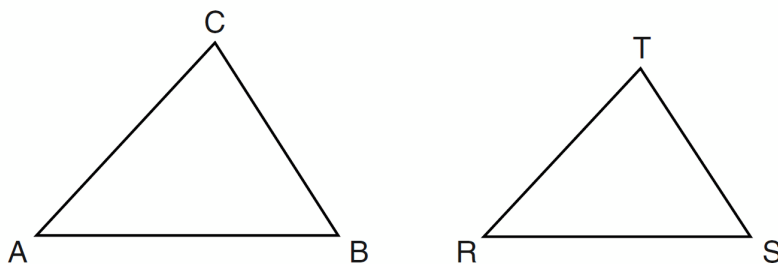   (1) (4, 3)   (2) (4, –2)   (3) (2, 3)   (4) (2, –1)

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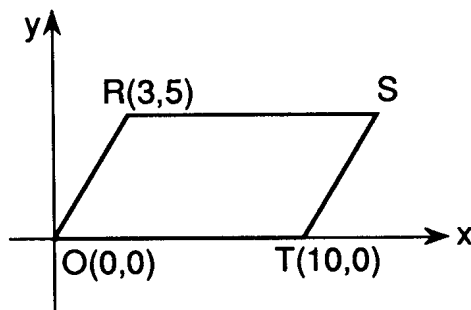

What is the length of $\overline{BC}$?

(1) 12   (2) 10   (3) 8   (4) 4

23. 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) $\frac{AB+BC+AC}{RS+ST+RT} = \frac{AB}{RS}$

24. 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)