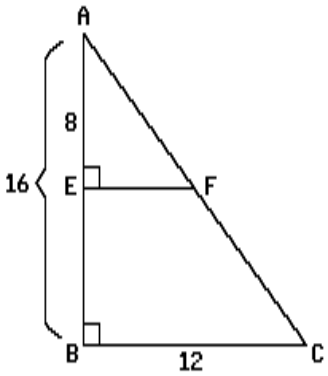
Name: _____

1) In the accompanying diagram of $\triangle ABC$, $\overline{AB} \perp \overline{BC}$ and $\overline{EF} \perp \overline{AB}$ at E. If BC = 12, AB = 16, and AE = 8, find EF.

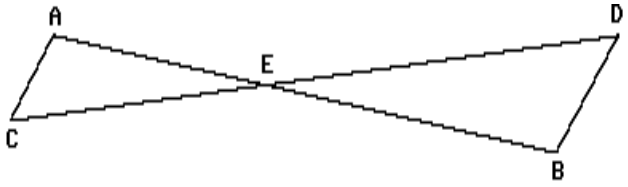


2) In right triangle ABC, altitude $\overline{CD}$ is drawn to the hypotenuse $\overline{AB}$. If AD = 4 and DB = 9, then CD is

A) 5 B) $\sqrt{3}$ C) 13 D) 6

3) In right triangle ABC, altitude $\overline{CD}$ is drawn to the hypotenuse $\overline{AB}$. If CD = 6 and AD = 3, find the length of DB.

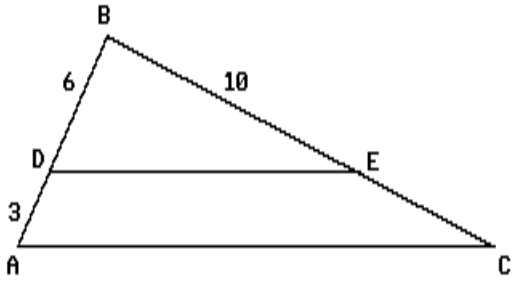
4) In the accompanying diagram, $\overline{AB}$ and $\overline{CD}$ intersect at point E such that $\overline{AC}$ is parallel to $\overline{DB}$. If AC = 3, DB = 4, and AB = 14, what is AE?



A) 19 C) 8

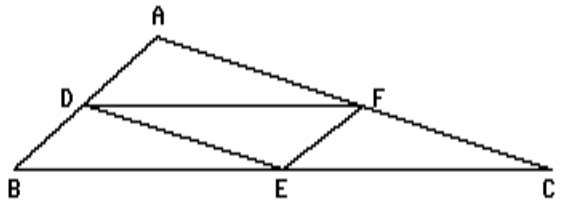
B) 10.5 D) 6

5) In the accompanying diagram of $\triangle ABC$, $\overline{DE} \parallel \overline{AC}$, BD = 6, DA = 3, and BE = 10. What is the measure of EC?



A) 20 B) 6 C) 15 D) 5

6) In the accompanying diagram of $\triangle ABC$, AB = 5, AC = 10, and BC = 13. Triangle DEF is formed by connecting the midpoints of the sides of $\triangle ABC$. Find the perimeter of $\triangle DEF$.



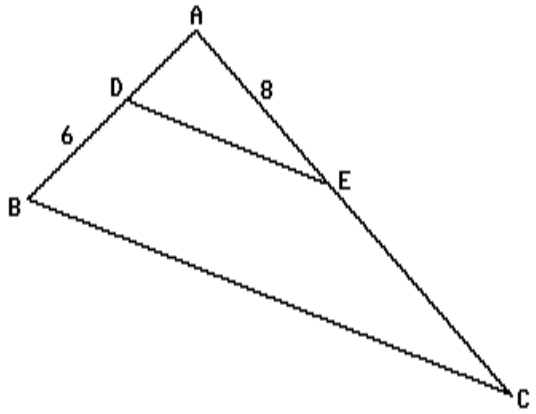
7) The ratio of the corresponding sides of two similar triangles is 7:5. Find the ratio of their perimeters.

8) The sides of a triangle are 3, 4, and 5. Find the length of the shortest side of a similar triangle whose longest side has length 20.

9) Which pair of triangles must be similar?

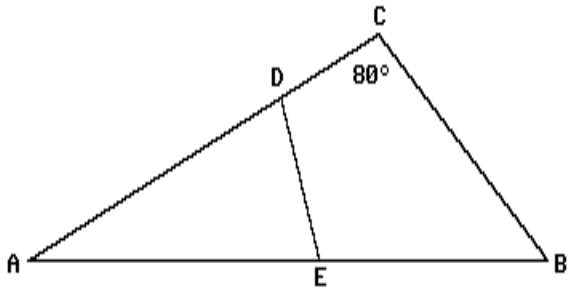
A) two right triangles
B) two scalene triangles with congruent bases
C) two isosceles triangles with congruent vertex angles
D) two obtuse triangles

10) In the accompanying diagram, $\overline{DE} \parallel \overline{BC}$, DB = 6, and AE = 8. If EC is three times AD, find AD.



11) The sides of a triangle measure 3, 4, and 5. Find the length of the smallest side of a similar triangle whose perimeter is 8.

12) In the accompanying diagram of $\triangle ABC$, $m\angle B = m\angle ADE$ and $m\angle C = 80°$. Find $m\angle AED$.



13) In right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If AD = 4 and DB = 16, find CD.

14) In triangle ABC, D is a point on $\overline{AB}$ and E is a point on $\overline{AC}$ such that $\overline{DE} \parallel \overline{BC}$. If AD = 2, DB = x - 1, AE = x, and EC = x + 2, find AE.

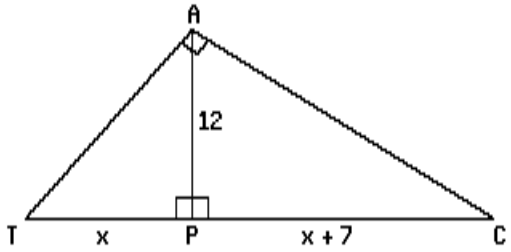
15) In triangle ABC, D is a point on $\overline{AB}$ and E is a point on $\overline{AC}$ such that $\overline{DE}$ is parallel to $\overline{BC}$. If AB = 12, AC = 15, and AD = 8, find the length of $\overline{AE}$.

16) In right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If AC = 4 and DB is 4 more that the length of $\overline{AD}$. find AD.

17) If the altitude drawn to the hypotenuse of a right triangle has length 10, the lengths of the segments of the hypotenuse may be

A) 5 and 20
B) 50 and 50
C) 2 and 5
D) 3 and 7

18) In the accompanying diagram of right triangle CAT, altitude $\overline{AP}$ divides hypotenuse $\overline{TC}$ into segments of lengths x and $x + 7$, and AP = 12.

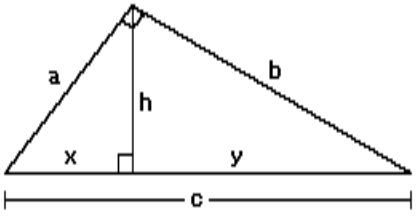


(a) Find the length of $\overline{TP}$.

(b) Find the area of $\triangle CAT$.

(c) Find the measure of $\angle T$ to the nearest degree.

19) In the accompanying figure, a, b, and c represent the sides of a right triangle. The segments made by altitude h drawn to hypotenuse c are represented by x and y. Which statement must be true?



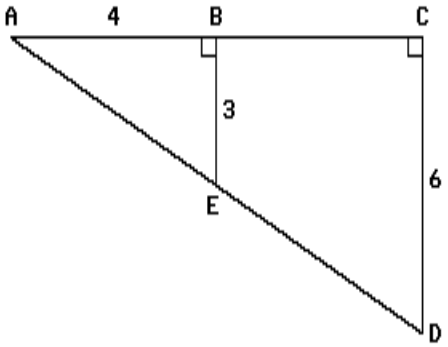
A) $b^2 = x^2 + y^2$

B) $\frac{x}{h} = \frac{h}{y}$

C) $\frac{x}{a} = \frac{a}{y}$

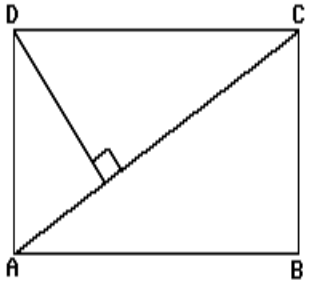
D) $\frac{h}{x} = \frac{x}{y}$

20) In the accompanying figure, $\overline{AB} \perp \overline{BE}$, $\overline{AC} \perp \overline{CD}$, AB = 4, BE = 3, and CD = 6. Find the length of $\overline{AC}$.



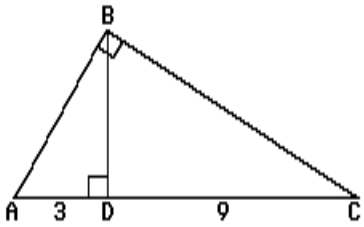
21) The sides of a triangle are 10, 11, and 13. Find the perimeter of the triangle that is formed by connecting the midpoints of the sides of the triangle.

22) In the accompanying diagram of rectangle ABCD, $\overline{DE}$ is perpendicular to diagonal $\overline{AC}$. If AE = 3 and EC = 9, what is the length of $\overline{AD}$?

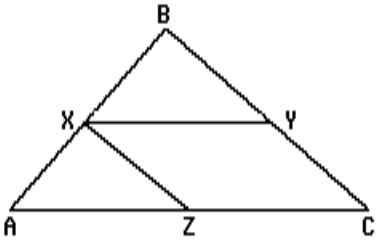


A) $\sqrt{27}$ B) 6 C) 5 D) 4

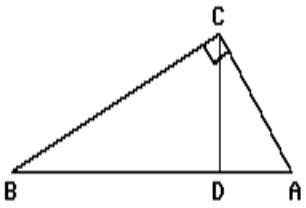
23) In the accompanying diagram of right triangle ABC, altitude $\overline{BD}$ divides hypotenuse $\overline{AC}$ into segments with lengths of 3 and 9. Find the length of leg $\overline{AB}$.



24) In the accompanying diagram of $\triangle ABC$, AB = 6, BC = 8, and AC = 12. Points X, Y, and Z are midpoints of $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$, respectively. Find the perimeter of quadrilateral XYCZ.



25) In the accompanying diagram of $\triangle ABC$, $m\angle ACB = 90°$ and $\overline{CD}$ is an altitude. If AD = 2 and DB = 6, find AC.



26) In right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If AD is 12 and DB is three less than the altitude, find the length of $\overline{CD}$.

27) The lengths of the sides of a triangle are 5, 12, and 13. What is the length of the longest side of a similar triangle whose perimeter is 90?

A) 36 B) 13 C) 39 D) 15

28) In $\triangle DEF$, X is a point on $\overline{EF}$ and Y is a point on $\overline{DF}$ so that $\overline{XY} \parallel \overline{DE}$. If XF = 10, YF = 6, and EF = 13, what is DY?

A) 11.2
B) 18
C) 1.8
D) 14.8

29) In right triangle ABC, $m\angle C = 90°$, D is a point on $\overline{AB}$, and $\overline{CD} \perp \overline{AB}$. If AB = 20 and AD = 5, the length of $\overline{AC}$ is

A) 2
B) $\sqrt{300}$
C) 10
D) 4

30) Find the length of the line segment that joins the midpoints of two sides of a triangle whose third side is 10.

31) A girl 5 feet tall casts a shadow 8 feet long. At the same time, a tree casts a shadow 24 feet long. What is the height, in feet, of the tree?