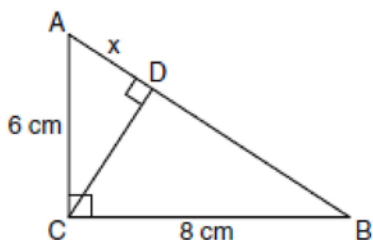


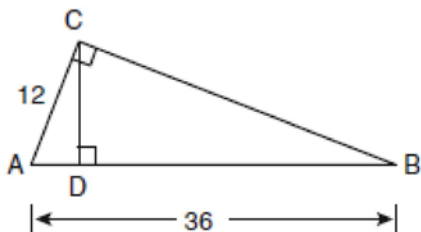
G.G.47: Similarity 2: Investigate theorems about mean proportionality: altitude to the hypotenuse of a right triangle divides hypotenuse so either leg of right triangle is mean

- 1 In the diagram below, the length of the legs \overline{AC} and \overline{BC} of right triangle ABC are 6 cm and 8 cm, respectively. Altitude \overline{CD} is drawn to the hypotenuse of $\triangle ABC$.



What is the length of \overline{AD} to the nearest tenth of a centimeter?

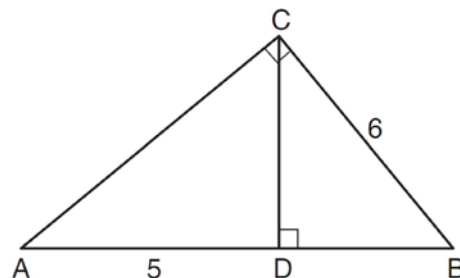
- 1) 3.6
 - 2) 6.0
 - 3) 6.4
 - 4) 4.0
- 2 In the diagram below of right triangle ACB , altitude \overline{CD} is drawn to hypotenuse \overline{AB} .



If $AB = 36$ and $AC = 12$, what is the length of \overline{AD} ?

- 1) 32
- 2) 6
- 3) 3
- 4) 4

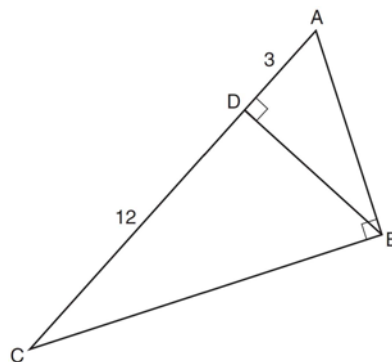
- 3 In the diagram below of right triangle ABC , \overline{CD} is the altitude to hypotenuse \overline{AB} , $CB = 6$, and $AD = 5$.



What is the length of \overline{BD} ?

- 1) 5
- 2) 9
- 3) 3
- 4) 4

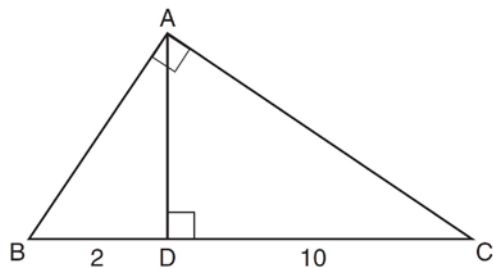
- 4 In right triangle ABC shown in the diagram below, altitude \overline{BD} is drawn to hypotenuse \overline{AC} , $CD = 12$, and $AD = 3$.



What is the length of \overline{AB} ?

- 1) $5\sqrt{3}$
- 2) 6
- 3) $3\sqrt{5}$
- 4) 9

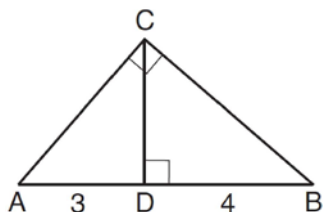
- 5 Triangle ABC shown below is a right triangle with altitude \overline{AD} drawn to the hypotenuse \overline{BC} .



If $BD = 2$ and $DC = 10$, what is the length of \overline{AB} ?

- 1) $2\sqrt{2}$
- 2) $2\sqrt{5}$
- 3) $2\sqrt{6}$
- 4) $2\sqrt{30}$

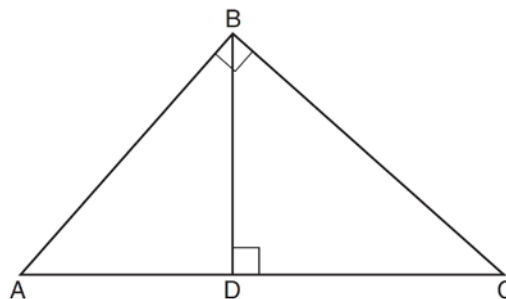
- 6 In the diagram below of right triangle ABC , \overline{CD} is the altitude to hypotenuse \overline{AB} , $AD = 3$, and $DB = 4$.



What is the length of \overline{CB} ?

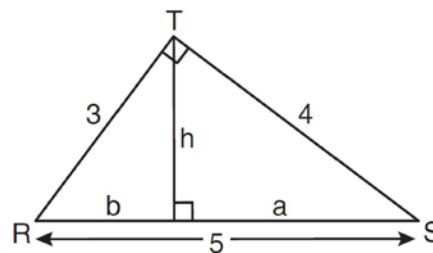
- 1) $2\sqrt{3}$
- 2) $\sqrt{21}$
- 3) $2\sqrt{7}$
- 4) $4\sqrt{3}$

- 7 In right triangle ABC shown below, altitude \overline{BD} is drawn to hypotenuse \overline{AC} .

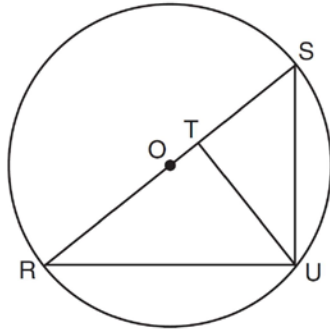


If $AD = 8$ and $DC = 10$, determine and state the length of \overline{AB} .

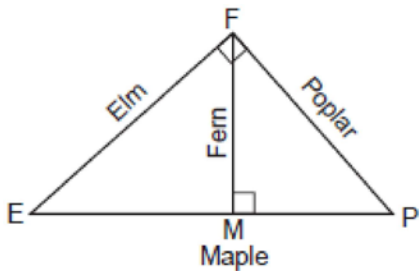
- 8 In the diagram below, $\triangle RST$ is a 3-4-5 right triangle. The altitude, h , to the hypotenuse has been drawn. Determine the length of h .



- 9 In the diagram below, right triangle RSU is inscribed in circle O , and \overline{UT} is the altitude drawn to hypotenuse \overline{RS} . The length of \overline{RT} is 16 more than the length of \overline{TS} and $TU = 15$. Find the length of \overline{TS} . Find, in simplest radical form, the length of \overline{RU} .



- 10 Four streets in a town are illustrated in the accompanying diagram. If the distance on Poplar Street from F to P is 12 miles and the distance on Maple Street from E to M is 10 miles, find the distance on Maple Street, in miles, from M to P .



G.G.47: Similarity 2: Investigate theorems about mean proportionality: altitude to the hypotenuse of a right triangle divides hypotenuse so either leg of right triangle is mean
Answer Section

1 ANS: 1

$\overline{AB} = 10$ since $\triangle ABC$ is a 6-8-10 triangle. $6^2 = 10x$

$$3.6 = x$$

REF: 060915ge

2 ANS: 4

Let $\overline{AD} = x$. $36x = 12^2$

$$x = 4$$

REF: 080922ge

3 ANS: 4

$$6^2 = x(x + 5)$$

$$36 = x^2 + 5x$$

$$0 = x^2 + 5x - 36$$

$$0 = (x + 9)(x - 4)$$

$$x = 4$$

REF: 011123ge

4 ANS: 3

$$x^2 = 3 \times 12. \sqrt{6^2 + 3^2} = \sqrt{45} = \sqrt{9} \sqrt{5} = 3\sqrt{5}$$

$$x = 6$$

REF: 061327ge

5 ANS: 3

$$x^2 = 2(2 + 10)$$

$$x^2 = 24$$

$$x = \sqrt{24} = \sqrt{4} \sqrt{6} = 2\sqrt{6}$$

REF: 081326ge

6 ANS: 3

$$x^2 = 4 \cdot 7$$

$$x = \sqrt{4} \cdot \sqrt{7}$$

$$x = 2\sqrt{7}$$

REF: 081528ge

7 ANS:

$$x^2 = 8(10 + 8)$$

$$x^2 = 144$$

$$x = 12$$

REF: 061431ge

8 ANS:

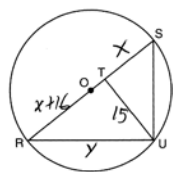
$$2.4. \quad 5a = 4^2 \quad 5b = 3^2 \quad h^2 = ab$$

$$a = 3.2 \quad b = 1.8 \quad h^2 = 3.2 \cdot 1.8$$

$$h = \sqrt{5.76} = 2.4$$

REF: 081037ge

9 ANS:



$$x(x + 16) = 15^2 \quad 25 \cdot 34 = y^2$$

$$x^2 + 16x - 225 = 0 \quad 5\sqrt{34} = y$$

$$(x + 25)(x - 9) = 0$$

$$x = 9$$

REF: 011538ge

10 ANS:

$$\frac{10 + x}{12} = \frac{12}{x}$$

$$x(10 + x) = 144$$

$$8. \quad x^2 + 10x - 144 = 0$$

$$(x + 18)(x - 8) = 0$$

$$x = 8$$

REF: 060828b