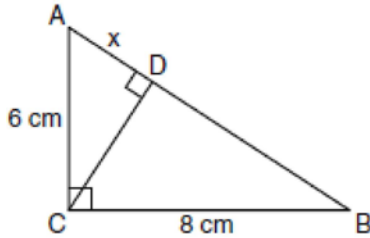


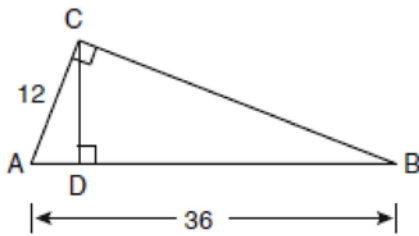
**G.SRT.B.5: Similarity 5**

- 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?

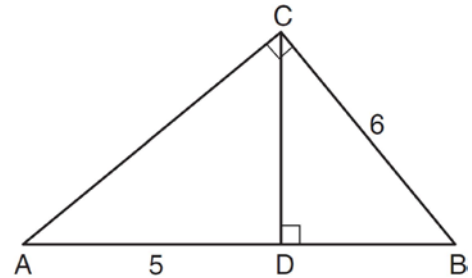
- 1) 3.6
  - 2) 6.0
  - 3) 6.4
  - 4) 4.0
- 2 In the diagram below of right triangle  $ACB$ , altitude  $\overline{CD}$  is drawn to hypotenuse  $\overline{AB}$ .



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

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

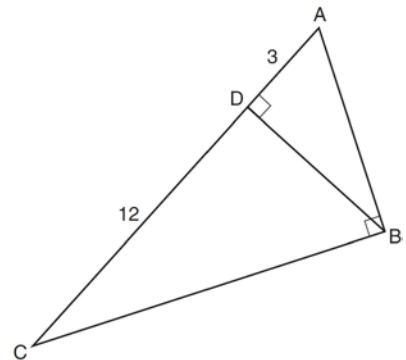
- 3 In the diagram below of right triangle  $ABC$ ,  $\overline{CD}$  is the altitude to hypotenuse  $\overline{AB}$ ,  $CB = 6$ , and  $AD = 5$ .



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

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

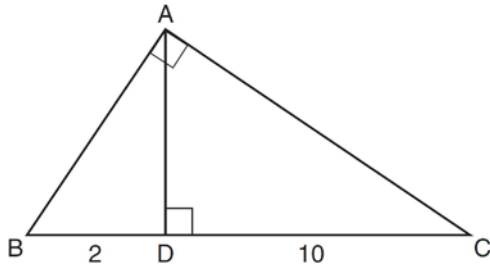
- 4 In right triangle  $ABC$  shown in the diagram below, altitude  $\overline{BD}$  is drawn to hypotenuse  $\overline{AC}$ ,  $CD = 12$ , and  $AD = 3$ .



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

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

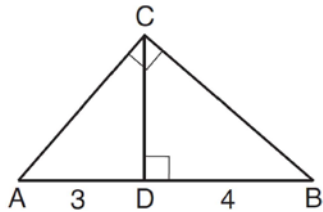
- 5 Triangle  $ABC$  shown below is a right triangle with altitude  $\overline{AD}$  drawn to the hypotenuse  $\overline{BC}$ .



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)  $2\sqrt{30}$

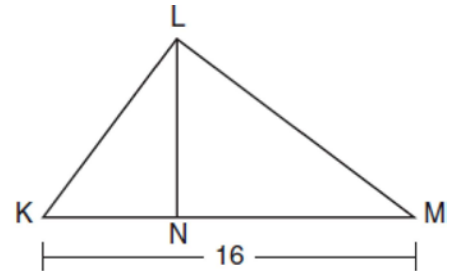
- 6 In the diagram below of right triangle  $ABC$ ,  $\overline{CD}$  is the altitude to hypotenuse  $\overline{AB}$ ,  $AD = 3$ , and  $DB = 4$ .



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

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

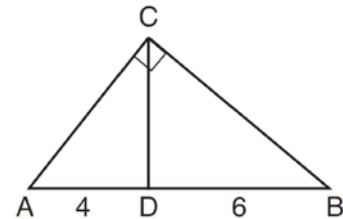
- 7 Kirstie is testing values that would make triangle  $KLM$  a right triangle when  $\overline{LN}$  is an altitude, and  $KM = 16$ , as shown below.



Which lengths would make triangle  $KLM$  a right triangle?

- 1)  $LM = 13$  and  $KN = 6$
- 2)  $LM = 12$  and  $NM = 9$
- 3)  $KL = 11$  and  $KN = 7$
- 4)  $LN = 8$  and  $NM = 10$

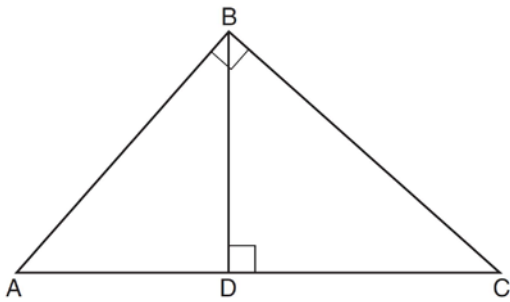
- 8 In the diagram of right triangle  $ABC$ ,  $\overline{CD}$  intersects hypotenuse  $\overline{AB}$  at  $D$ .



If  $AD = 4$  and  $DB = 6$ , which length of  $\overline{AC}$  makes  $\overline{CD} \perp \overline{AB}$ ?

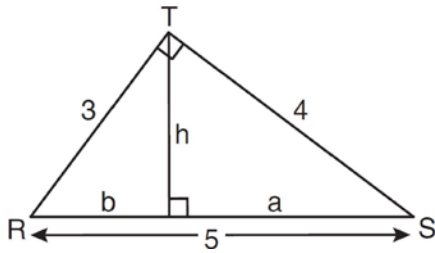
- 1)  $2\sqrt{6}$
- 2)  $2\sqrt{10}$
- 3)  $2\sqrt{15}$
- 4)  $4\sqrt{2}$

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

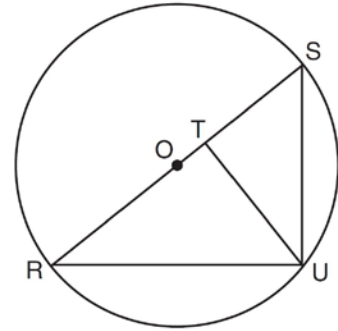


If  $AD = 8$  and  $DC = 10$ , determine and state the length of  $\overline{AB}$ .

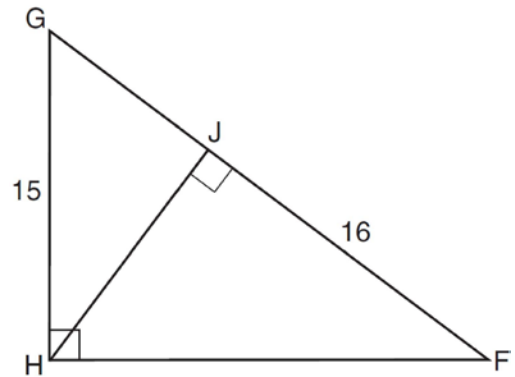
- 10 In the diagram below,  $\triangle RST$  is a 3–4–5 right triangle. The altitude,  $h$ , to the hypotenuse has been drawn. Determine the length of  $h$ .



- 11 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  $\overline{RU}$ .

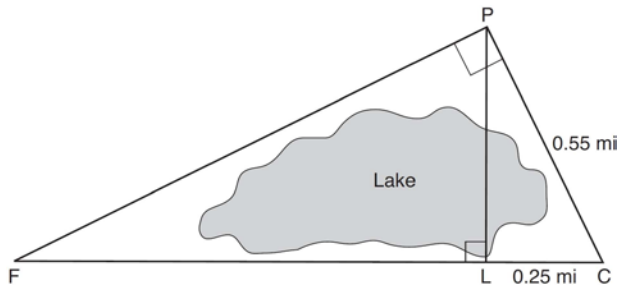


- 12 In right triangle  $FGH$  shown below,  $m\angle GHF = 90^\circ$ , altitude  $\overline{HJ}$  is drawn to  $\overline{FG}$ ,  $FJ = 16$ , and  $HG = 15$ .



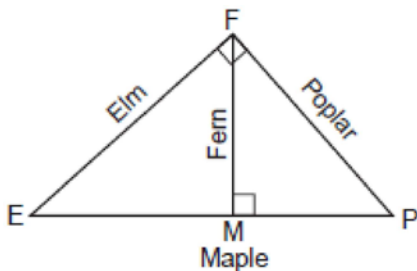
Determine and state the length of  $\overline{JG}$ . Determine and state the length of  $\overline{HJ}$ . [Only algebraic solutions can receive full credit.]

- 13 In the diagram below, the line of sight from the park ranger station,  $P$ , to the lifeguard chair,  $L$ , on the beach of a lake is perpendicular to the path joining the campground,  $C$ , and the first aid station,  $F$ . The campground is 0.25 mile from the lifeguard chair. The straight paths from both the campground and first aid station to the park ranger station are perpendicular.



If the path from the park ranger station to the campground is 0.55 mile, determine and state, to the *nearest hundredth of a mile*, the distance between the park ranger station and the lifeguard chair. Gerald believes the distance from the first aid station to the campground is at least 1.5 miles. Is Gerald correct? Justify your answer.

- 14 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.SRT.B.5: Similarity 5 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: 2  
 $12^2 = 9 \cdot 16$   
 $144 = 144$

REF: 081718geo

8 ANS: 2  
 $x^2 = 4 \cdot 10$   
 $x = \sqrt{40}$   
 $x = 2\sqrt{10}$

REF: 081610geo

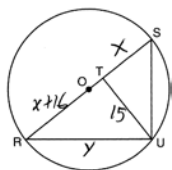
9 ANS:  
 $x^2 = 8(10 + 8)$   
 $x^2 = 144$   
 $x = 12$

REF: 061431ge

10 ANS:  
 2.4.  $5a = 4^2$   $5b = 3^2$   $h^2 = ab$   
 $a = 3.2$   $b = 1.8$   $h^2 = 3.2 \cdot 1.8$   
 $h = \sqrt{5.76} = 2.4$

REF: 081037ge

11 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

12 ANS:

$$x(x+16) = 15^2 \quad y^2 = 16 \cdot 9$$

$$x^2 + 16x - 225 = 0 \quad y^2 = 144$$

$$(x+25)(x-9) = 0 \quad y = 12$$

$$x = 9$$

REF: 011638ge

13 ANS:

$$x = \sqrt{.55^2 - .25^2} \cong 0.49 \quad \text{No, } .49^2 = .25y \quad .9604 + .25 < 1.5$$

$$.9604 = y$$

REF: 061534geo

14 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