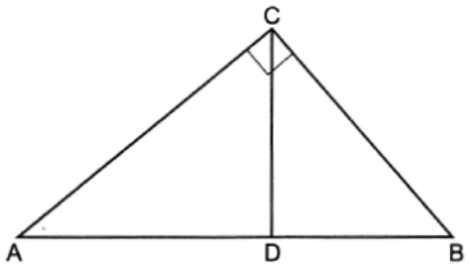
Name: _____

G.SRT.B.4: Similarity 1

1 In the diagram shown below, altitude $\overline{CD}$ is drawn to the hypotenuse of right triangle ABC.



Which equation can always be used to find the length of $\overline{AC}$?

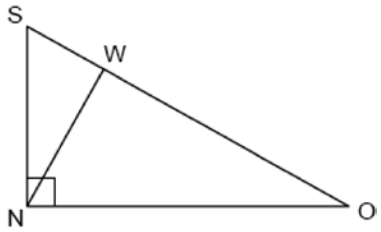
1) $\frac{AC}{CD} = \frac{CD}{AD}$

2) $\frac{CD}{AC} = \frac{AC}{AB}$

3) $\frac{AC}{CD} = \frac{CD}{BC}$

4) $\frac{AB}{AC} = \frac{AC}{AD}$

2 In right triangle SNO below, altitude $\overline{NW}$ is drawn to hypotenuse $\overline{SO}$.



Which statement is *not* always true?

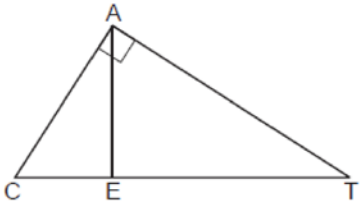
1) $\frac{SO}{SN} = \frac{SN}{SW}$

2) $\frac{SW}{NS} = \frac{NS}{OW}$

3) $\frac{SO}{ON} = \frac{ON}{OW}$

4) $\frac{OW}{NW} = \frac{NW}{SW}$

3 In the diagram of $\triangle CAT$ below, m$\angle A = 90°$ and altitude $\overline{AE}$ is drawn from vertex A.



Which statement is always true?

1) $\frac{CE}{AE} = \frac{AE}{ET}$

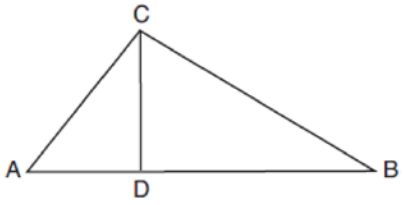
2) $\frac{AE}{CE} = \frac{AE}{ET}$

3) $\frac{AC}{CE} = \frac{AT}{ET}$

4) $\frac{CE}{AC} = \frac{AC}{ET}$

Name: _____

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



Which equation is always true?

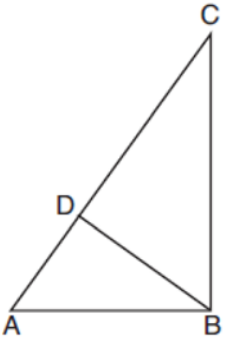
1) $\frac{AD}{AC} = \frac{CD}{BC}$

2) $\frac{AD}{CD} = \frac{BD}{CD}$

3) $\frac{AC}{CD} = \frac{BC}{CD}$

4) $\frac{AD}{AC} = \frac{AC}{BD}$

5 In the accompanying diagram of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$.



Which statement must always be true?

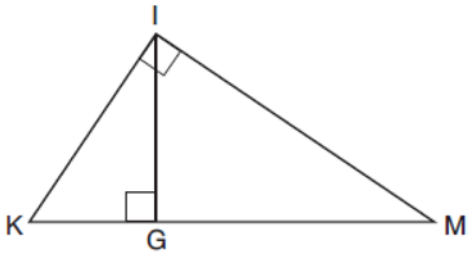
1) $\frac{AD}{AB} = \frac{BC}{AC}$

2) $\frac{AD}{AB} = \frac{AB}{AC}$

3) $\frac{BD}{BC} = \frac{AB}{AD}$

4) $\frac{AB}{BC} = \frac{BD}{AC}$

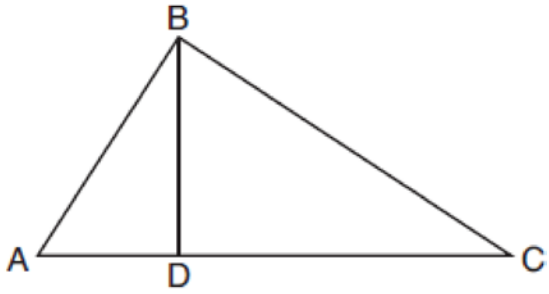
6 In the diagram below of right triangle KMI, altitude $\overline{IG}$ is drawn to hypotenuse $\overline{KM}$.



If $KG = 9$ and $IG = 12$, the length of $\overline{IM}$ is

1) 15
2) 16
3) 20
4) 25

7 In the diagram below of right triangle ABC, altitude $\overline{BD}$ is drawn to hypotenuse $\overline{AC}$.

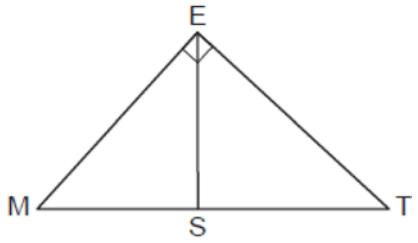


If $BD = 4$, $AD = x - 6$, and $CD = x$, what is the length of $\overline{CD}$?

1) 5
2) 2
3) 8
4) 11

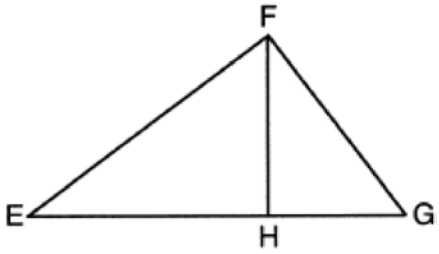
Name: _____

8 In the diagram below of right triangle MET, altitude $\overline{ES}$ is drawn to hypotenuse $\overline{MT}$.



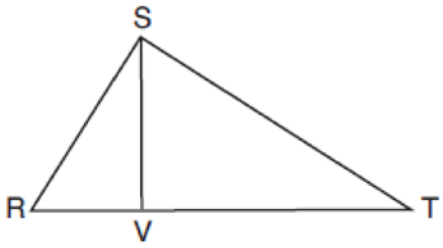
If $ME = 6$ and $SM = 4$, what is MT?
1) 9
2) 8
3) 5
4) 4

9 In the diagram below of right triangle EFG, altitude $\overline{FH}$ intersects hypotenuse $\overline{EG}$ at H.



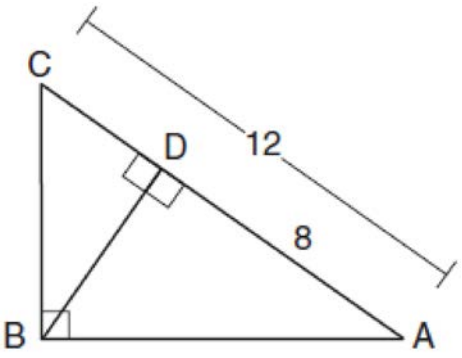
If $FH = 9$ and $EF = 15$, what is EG?
1) 6.75
2) 12
3) 18.75
4) 25

10 In right triangle RST below, altitude $\overline{SV}$ is drawn to hypotenuse $\overline{RT}$.



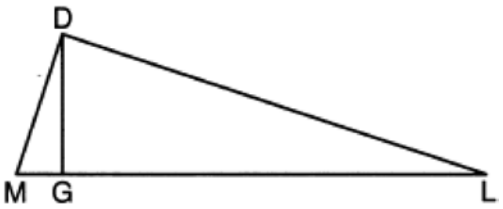
If $RV = 4.1$ and $TV = 10.2$, what is the length of $\overline{ST}$, to the *nearest tenth*?
1) 6.5
2) 7.7
3) 11.0
4) 12.1

11 In the diagram below of $\triangle ABC$, $\angle ABC$ is a right angle, $AC = 12$, $AD = 8$, and altitude $\overline{BD}$ is drawn.



What is the length of $\overline{BC}$?
1) $4\sqrt{2}$
2) $4\sqrt{3}$
3) $4\sqrt{5}$
4) $4\sqrt{6}$

12 In the diagram below of right triangle MDL, altitude $\overline{DG}$ is drawn to hypotenuse $\overline{ML}$.



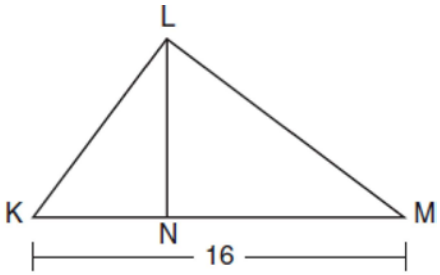
If $MG = 3$ and $GL = 24$, what is the length of $\overline{DG}$?
1) 8
2) 9
3) $\sqrt{63}$
4) $\sqrt{72}$

13 In right triangle ABC, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. If $AD = 4$ and $CD = 8$, the length of $\overline{BD}$ is
1) $\sqrt{48}$
2) $\sqrt{80}$
3) 12
4) 16

14 Line segment CD is the altitude drawn to hypotenuse $\overline{EF}$ in right triangle ECF. If $EC = 10$ and $EF = 24$, then, to the *nearest tenth*, ED is
1) 4.2
2) 5.4
3) 15.5
4) 21.8

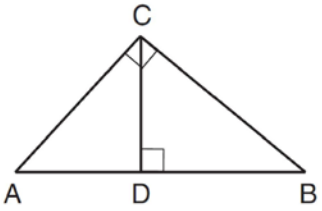
15 In right triangle RST, altitude $\overline{TV}$ is drawn to hypotenuse $\overline{RS}$. If $RV = 12$ and $RT = 18$, what is the length of $\overline{SV}$?
1) $6\sqrt{5}$
2) 15
3) $6\sqrt{6}$
4) 27

16 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 $NM = 10$

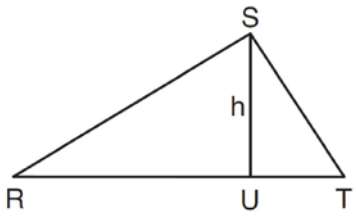
17 In the diagram below, $\overline{CD}$ is the altitude drawn to the hypotenuse $\overline{AB}$ of right triangle ABC.



Which lengths would *not* produce an altitude that measures $6\sqrt{2}$?
1) $AD = 2$ and $DB = 36$
2) $AD = 3$ and $AB = 24$
3) $AD = 6$ and $DB = 12$
4) $AD = 8$ and $AB = 17$

Name: _____

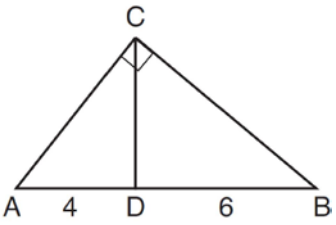
18 In $\triangle RST$ shown below, altitude $\overline{SU}$ is drawn to $\overline{RT}$ at U.



If $SU = h$, $UT = 12$, and $RT = 42$, which value of h will make $\triangle RST$ a right triangle with $\angle RST$ as a right angle?

1) $6\sqrt{3}$
2) $6\sqrt{10}$
3) $6\sqrt{14}$
4) $6\sqrt{35}$

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



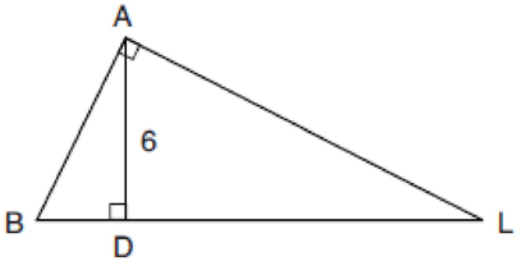
If $AD = 4$ and $DB = 6$, which length of $\overline{AC}$ makes $\overline{CD} \perp \overline{AB}$?

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

20 In the diagram below of right triangle ACB, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$, $AD = 2$ and $AC = 6$.

Determine and state the length of $\overline{AB}$.

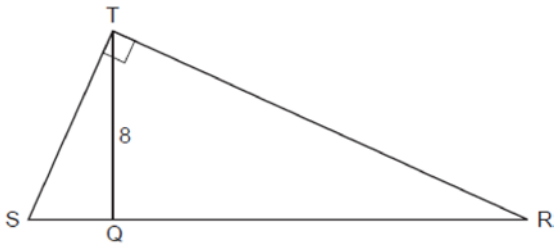
21 In the diagram below of right triangle BAL, altitude $\overline{AD}$ is drawn to hypotenuse $\overline{BDL}$. The length of $\overline{AD}$ is 6.



If the length of $\overline{DL}$ is four times the length of $\overline{BD}$, determine and state the length of $\overline{BD}$.

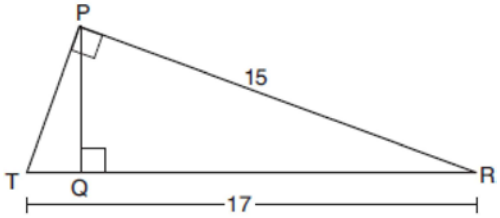
Name: _____

22 Right triangle STR is shown below, with $m\angle T = 90°$. Altitude $\overline{TQ}$ is drawn to $\overline{SQR}$, and $TQ = 8$.



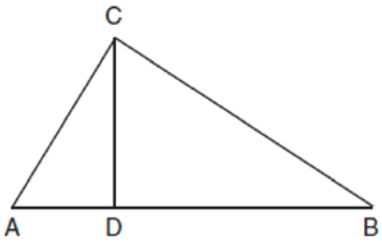
If the ratio $SQ:QR$ is 1:4, determine and state the length of $\overline{SR}$.

23 In right triangle PRT, $m\angle P = 90°$, altitude $\overline{PQ}$ is drawn to hypotenuse $\overline{RT}$, $RT = 17$, and $PR = 15$.

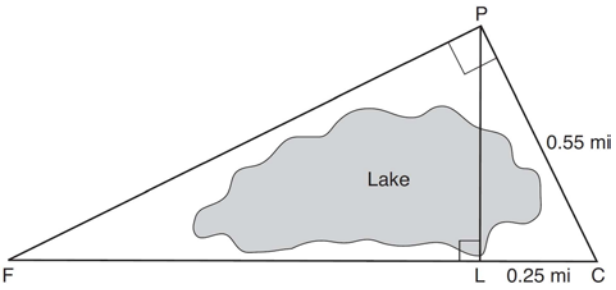


Determine and state, to the *nearest tenth*, the length of $\overline{RQ}$.

24 In right triangle ABC shown below, altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$. Explain why $\triangle ABC \sim \triangle ACD$.



25 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.

G.SRT.B.4: Similarity 1
Answer Section

1 ANS: 4 REF: 062422geo
2 ANS: 2 REF: 082419geo
3 ANS: 1 REF: 012418geo
4 ANS: 1 REF: 081916geo
5 ANS: 2
$\overline{AB} = 10$ since $\triangle ABC$ is a 6-8-10 triangle. $6^2 = 10x$

$3.6 = x$

REF: 081820geo
6 ANS: 3
$12^2 = 9 \cdot GM$ $IM^2 = 16 \cdot 25$

$GM = 16$ $IM = 20$

REF: 011910geo
7 ANS: 3
$x(x-6) = 4^2$

$x^2 - 6x - 16 = 0$

$(x-8)(x+2) = 0$

$x = 8$

REF: 081807geo
8 ANS: 1
$6^2 = 4x$

$x = 9$

REF: 012412geo
9 ANS: 3
$12x = 9^2$ $6.75 + 12 = 18.75$

$12x = 81$

$x = \frac{82}{12} = \frac{27}{4}$

REF: 062213geo
10 ANS: 4
$x^2 = 10.2 \times 14.3$

$x \approx 12.1$

REF: 012016geo

11 ANS: 2

$x^2 = 12(12 - 8)$

$x^2 = 48$

$x = 4\sqrt{3}$

REF: 011823geo

12 ANS: 4

$x^2 = 3 \times 24$

$x = \sqrt{72}$

REF: 012315geo

13 ANS: 4

$8^2 = 4x$

$64 = 4x$

$16 = x$

REF: 062416geo

14 ANS: 1

$24x = 10^2$

$24x = 100$

$x \approx 4.2$

REF: 061823geo

15 ANS: 2

$18^2 = 12(x + 12)$

$324 = 12(x + 12)$

$27 = x + 12$

$x = 15$

REF: 081920geo

16 ANS: 2

$12^2 = 9 \cdot 16$

$144 = 144$

REF: 081718geo

17 ANS: 2

$\sqrt{3 \cdot 21} = \sqrt{63} = 3\sqrt{7}$

REF: 011622geo

18 ANS: 2

$h^2 = 30 \cdot 12$

$h^2 = 360$

$h = 6\sqrt{10}$

REF: 061613geo

19 ANS: 2

$x^2 = 4 \cdot 10$

$x = \sqrt{40}$

$x = 2\sqrt{10}$

REF: 081610geo

20 ANS:

$6^2 = 2(x + 2);\ 16 + 2 = 18$

$36 = 2x + 4$

$32 = 2x$

$16 = x$

REF: 062330geo

21 ANS:

$4x \cdot x = 6^2$

$4x^2 = 36$

$x^2 = 9$

$x = 3$

REF: 082229geo

22 ANS:

$4x \cdot x = 8^2\ \ 4 + 4(4) = 20$

$4x^2 = 64$

$x^2 = 16$

$x = 4$

REF: 082330geo

23 ANS:

$17x = 15^2$

$17x = 225$

$x \approx 13.2$

REF: 061930geo

24 ANS:

If an altitude is drawn to the hypotenuse of a triangle, it divides the triangle into two right triangles similar to each other and the original triangle.

REF: 061729geo

25 ANS:

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

$.9604 = y$

REF: 061534geo