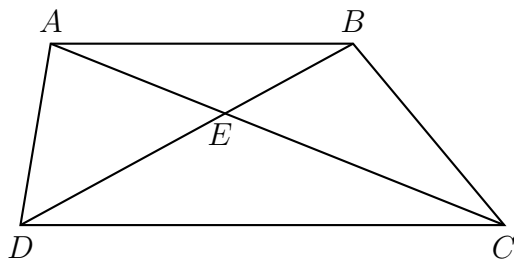


Regents: Similarity

1. Triangle JGR is similar to triangle MST . Which statement is *not* always true?

- (a) $\angle J \cong \angle M$ (c) $\angle R \cong \angle T$
 (b) $\angle G \cong \angle T$ (d) $\angle G \cong \angle S$

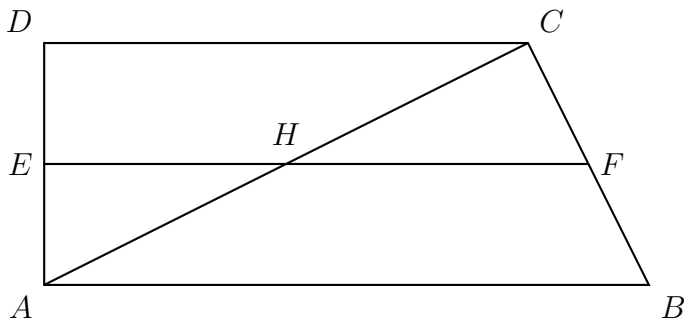
2. In trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{CD}$.



If $AE = 5.2$, $AC = 11.7$, and $CD = 10.5$, what is the length of \overline{AB} , to the nearest tenth?

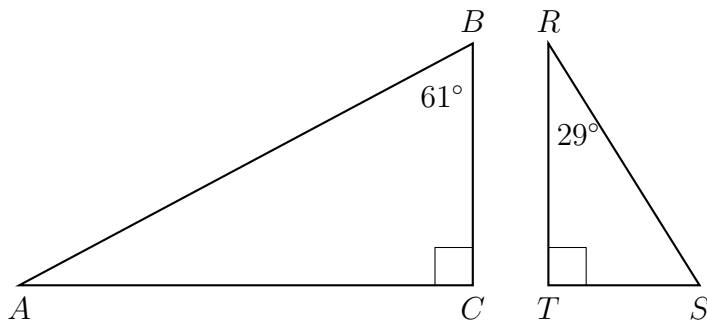
3. The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?

4. In quadrilateral $ABCD$ below, $\overline{AB} \parallel \overline{CD}$, and E , H , and F are the midpoints of \overline{AD} , \overline{AC} , and \overline{BC} , respectively.



If $AB = 24$, $CD = 18$, and $AH = 10$, then what is FH ?

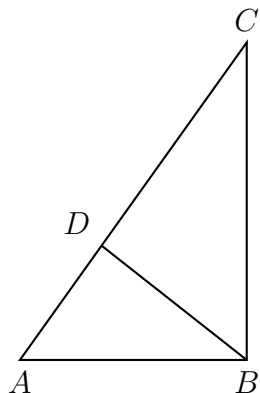
5. Given right triangle ABC with a right angle at C , $m\angle B = 61^\circ$. Given right triangle RST with a right angle at T , $m\angle R = 29^\circ$.



Which proportion in relation to $\triangle ABC$ and $\triangle RST$ is *not* correct?

- (a) $\frac{AB}{RS} = \frac{RT}{AC}$ (c) $\frac{BC}{ST} = \frac{AC}{RT}$
 (b) $\frac{BC}{ST} = \frac{AB}{RS}$ (d) $\frac{AB}{AC} = \frac{RS}{RT}$

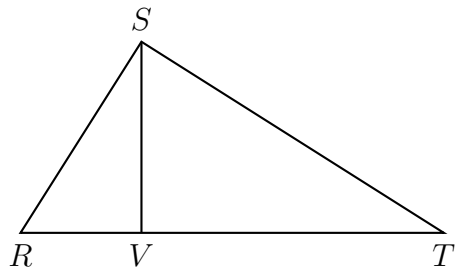
6. In the accompanying diagram of right triangle ABC , altitude \overline{BD} is drawn to hypotenuse \overline{AC} .



Which statement must be true?

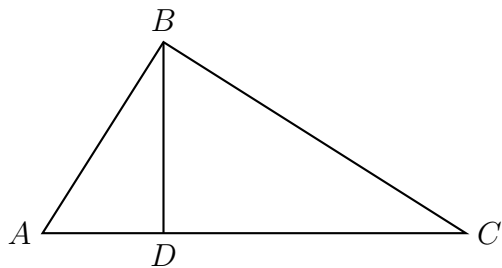
- (a) $\frac{AD}{AB} = \frac{BC}{AC}$ (c) $\frac{BD}{BC} = \frac{AB}{AD}$
 (b) $\frac{AD}{AB} = \frac{AB}{AC}$ (d) $\frac{AB}{BC} = \frac{BD}{AC}$

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



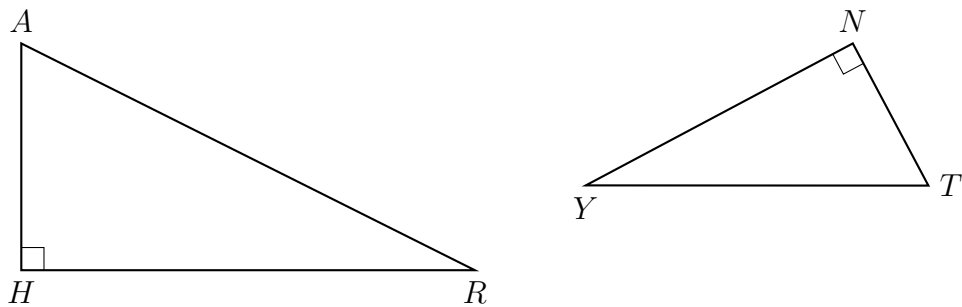
If $RV = 4.1$ and $TV = 10.2$, what is the length of \overline{ST} , to the *nearest tenth*?

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



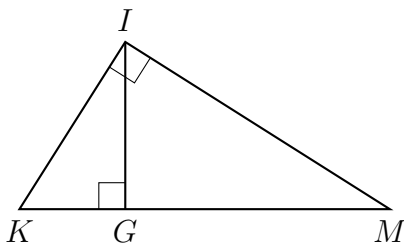
If $BD = 4$, $AD = x - 6$, and $CD = x$, what is the length of \overline{CD} ?

9. In the diagram below of $\triangle HAR$ and $\triangle NTY$, angles H and N are right angles, and $\triangle HAR \sim \triangle NTY$



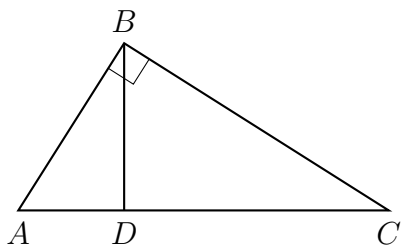
If $AR = 13$ and $HR = 12$, what is the measure of $\angle Y$, to the *nearest degree*?

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



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

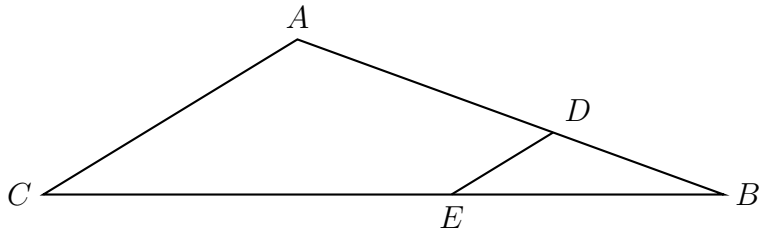
11. In diagram below of right triangle ABC , altitude \overline{BD} is drawn.



Which ratio is always equivalent to $\cos A$?

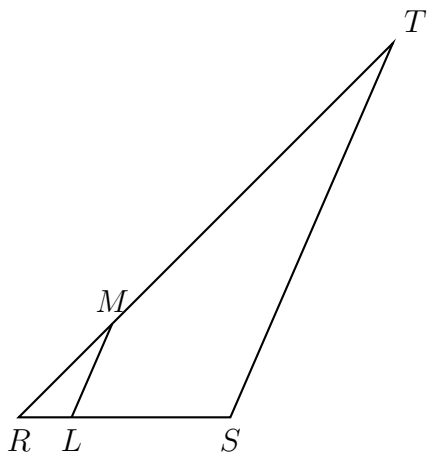
- | | |
|---------------------|---------------------|
| (a) $\frac{AB}{BC}$ | (c) $\frac{BD}{AB}$ |
| (b) $\frac{BD}{BC}$ | (d) $\frac{BC}{AC}$ |

12. In the diagram of $\triangle ABC$ below, points D and E are on sides \overline{AB} and \overline{CB} respectively, such that $\overline{DE} \parallel \overline{AC}$.



IF ED is 3 more than DB , $AB = 14$, and $CB = 21$, what is the length of \overline{AD} ?

13. In the diagram below of $\triangle RST$, L is a point on \overline{RS} , and M is a point on \overline{RT} , such that $\overline{LM} \parallel \overline{ST}$.



IF $RL = 2$, $LS = 6$, $LM = 4$, and $ST = x + 2$, what is the length of \overline{ST} ?

$$f(n) = \begin{cases} n/2 & \text{if } n \text{ is even} \\ -(n+1)/2 & \text{if } n \text{ is odd} \end{cases}$$