11.2 Regents: Similar triangles   HSG.SRT.B.5
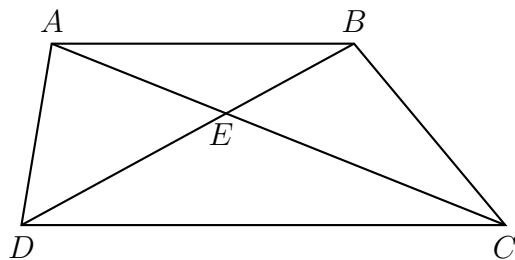
1. Triangle JGR is similar to triangle MST. Which statement is *not* always true?

   (a) $\angle J \cong \angle M$ (c) $\angle R \cong \angle T$

   (b) $\angle G \cong \angle T$ (d) $\angle G \cong \angle S$
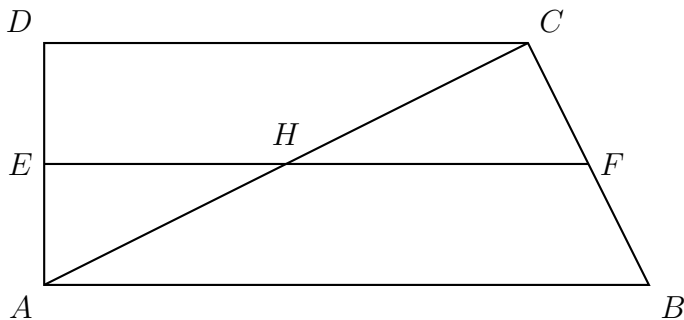
2. In trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{CD}$.

   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.
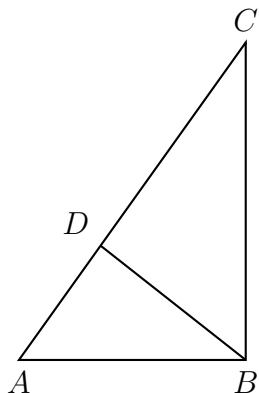

   If $AB = 24$, $CD = 18$, and $AH = 10$, then what is FH?

5. Given right triangle ABC with a right angle at C, $m\angle B = 61°$. Given right triangle RST with a right angle at T, $m\angle R = 29°$.
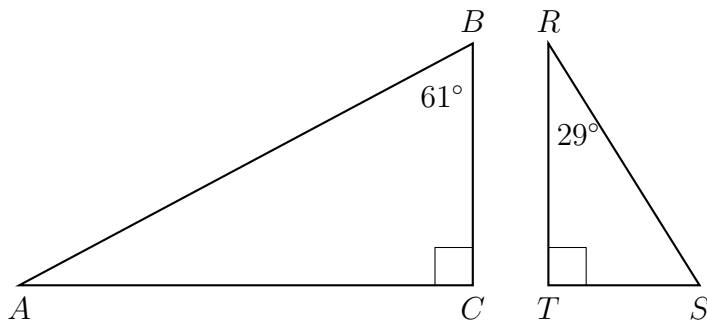
Which proportion in relation to $\triangle ABC$ and $\triangle RST$ is *not* correct?

(a) $\dfrac{AB}{RS} = \dfrac{RT}{AC}$

(b) $\dfrac{BC}{ST} = \dfrac{AB}{RS}$

(c) $\dfrac{BC}{ST} = \dfrac{AC}{RT}$
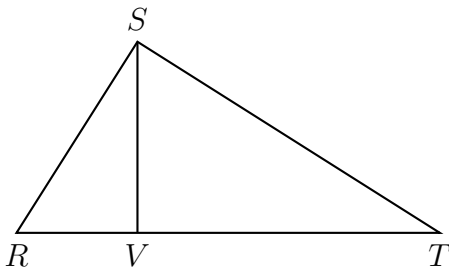
(d) $\dfrac{AB}{AC} = \dfrac{RS}{RT}$

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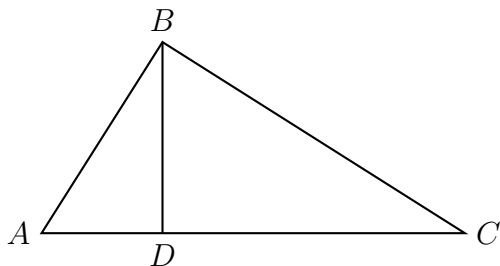

Which statement must be true?

(a) $\dfrac{AD}{AB} = \dfrac{BC}{AC}$

(b) $\dfrac{AD}{AB} = \dfrac{AB}{AC}$

(c) $\dfrac{BD}{BC} = \dfrac{AB}{AD}$

(d) $\dfrac{AB}{BC} = \dfrac{BD}{AC}$

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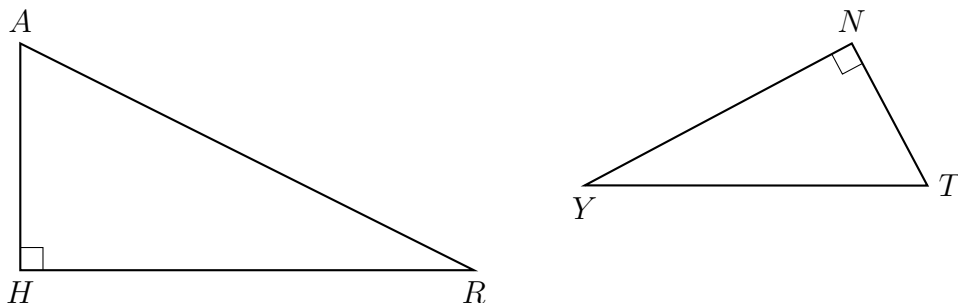

If $RV = 4.1$ and $TV = 10.2$, what is the length of $\overline{ST}$, to the *nearest tenth*?

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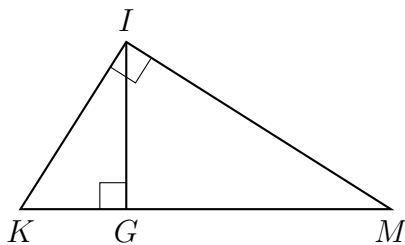

If $BD = 4$, $AD = x - 6$, and $CD = x$, what is the length of $\overline{CD}$?

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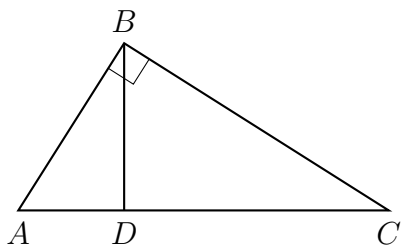

If $AR = 13$ and $HR = 12$, what is the measure of $\angle Y$, to the *nearest degree*?

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

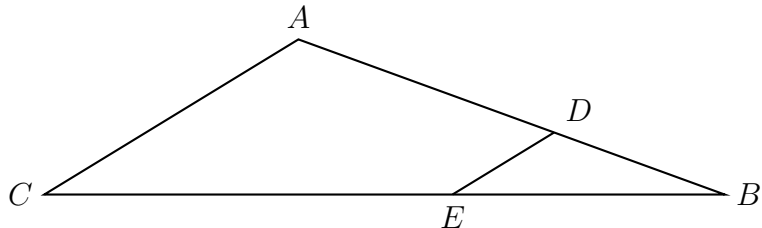IF $KG = 9$ and $IG = 12$, what is the length of $\overline{IM}$?

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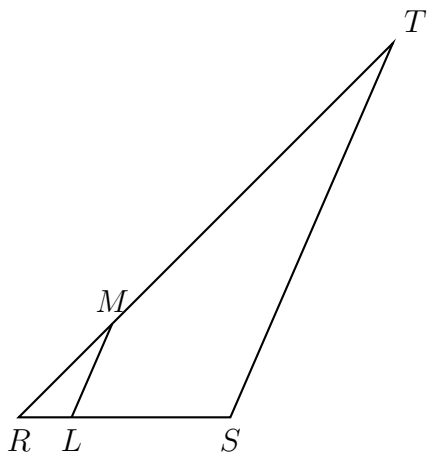

Which ratio is always equivalent to $\cos A$?

(a) $\dfrac{AB}{BC}$ (c) $\dfrac{BD}{AB}$

(b) $\dfrac{BD}{BC}$ (d) $\dfrac{BC}{AC}$

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 EB 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 $\overline{ST}$?

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