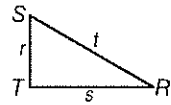


8-4 Study Guide and Intervention

Trigonometry

Trigonometric Ratios The ratio of the lengths of two sides of a right triangle is called a **trigonometric ratio**. The three most common ratios are **sine**, **cosine**, and **tangent**, which are abbreviated *sin*, *cos*, and *tan*, respectively.



$$\sin R = \frac{\text{leg opposite } \angle R}{\text{hypotenuse}}$$

$$= \frac{r}{t}$$

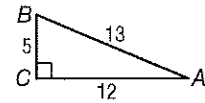
$$\cos R = \frac{\text{leg adjacent to } \angle R}{\text{hypotenuse}}$$

$$= \frac{s}{t}$$

$$\tan R = \frac{\text{leg opposite } \angle R}{\text{leg adjacent to } \angle R}$$

$$= \frac{r}{s}$$

Example Find $\sin A$, $\cos A$, and $\tan A$. Express each ratio as a fraction and a decimal to the nearest hundredth.



$$\sin A = \frac{\text{opposite leg}}{\text{hypotenuse}}$$

$$= \frac{BC}{BA}$$

$$= \frac{5}{13}$$

$$\approx 0.39$$

$$\cos A = \frac{\text{adjacent leg}}{\text{hypotenuse}}$$

$$= \frac{AC}{AB}$$

$$= \frac{12}{13}$$

$$\approx 0.92$$

$$\tan A = \frac{\text{opposite leg}}{\text{adjacent leg}}$$

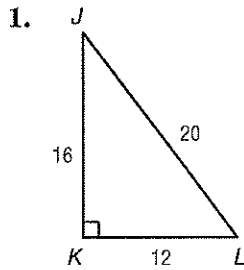
$$= \frac{BC}{AC}$$

$$= \frac{5}{12}$$

$$\approx 0.42$$

Exercises

Find $\sin J$, $\cos J$, $\tan J$, $\sin L$, $\cos L$, and $\tan L$. Express each ratio as a fraction and as a decimal to the nearest hundredth.



$$\sin J = \frac{12}{20} = .6$$

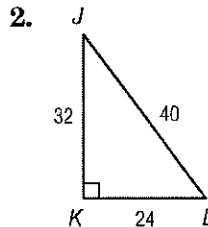
$$\cos J = \frac{16}{20} = .8$$

$$\tan J = \frac{12}{16} = .75$$

$$\sin L = \frac{16}{20} = .8$$

$$\cos L = \frac{12}{20} = .6$$

$$\tan L = \frac{16}{12} = 1.33$$



$$\sin J = \frac{24}{40} = .6$$

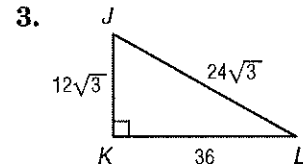
$$\cos J = \frac{32}{40} = .8$$

$$\tan J = \frac{24}{32} = .75$$

$$\sin L = \frac{32}{40} = .8$$

$$\cos L = \frac{24}{40} = .6$$

$$\tan L = \frac{32}{24} = 1.33$$



$$\sin J = \frac{36}{24\sqrt{3}} = \frac{36\sqrt{3}}{72} = .87$$

$$\cos J = \frac{12\sqrt{3}}{24\sqrt{3}} = .5$$

$$\tan J = \frac{36}{12\sqrt{3}} = \frac{36\sqrt{3}}{36\sqrt{3}} = 1$$

$$\sin L = \frac{12\sqrt{3}}{24\sqrt{3}} = .5$$

$$\cos L = \frac{36}{24\sqrt{3}} = \frac{36\sqrt{3}}{36\sqrt{3}} = 1$$

$$\tan L = \frac{12\sqrt{3}}{36} = \frac{\sqrt{3}}{3} \approx .58$$