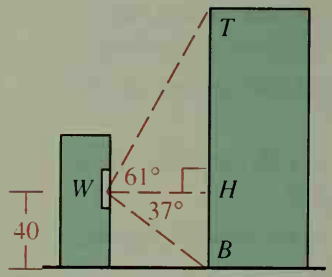
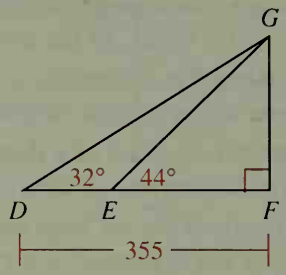
29. A person at window W, 40 ft above street level, sights points on a building directly across the street. H is chosen so that $\overline{WH}$ is horizontal. T is directly above H, and B is directly below. By measurement, $m\angle TWH = 61$ and $m\angle BWH = 37$. How far above street level is T?



Ex. 29



Ex. 30

30. Use the figure to find EF to the nearest integer.

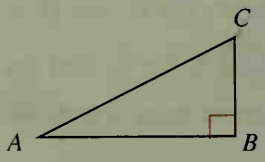
Explorations

These exploratory exercises can be done using a computer with a program that draws and measures geometric figures.

As you will learn in the next section, two other trigonometric ratios are the *sine* and *cosine*. If $\triangle ABC$ has a right angle at B, then:

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

$$\cos A = \frac{\text{leg adjacent to } \angle A}{\text{hypotenuse}} = \frac{AB}{AC}$$



Using ASA, draw nine right triangles using nine values for $m\angle A$: 10, 20, 30, 40, 45, 50, 60, 70, and 80. Keep $m\angle B = 90$.

Compute and record sin A, cos A, and tan A for each measure of $\angle A$. What do you notice?

If you change the length of $\overline{AB}$ but keep the measures of $\angle A$ and $\angle B$ the same, do the sine, cosine, and tangent of $\angle A$ change?

Complete.

1. $\cos x° = \sin x°$ when $x =$ ___?___
2. $\cos (90 - x)° = \sin$ ___?___
3. $\sin (90 - x)° = \cos$ ___?___
4. $\tan x° \cdot \tan (90 - x)° =$ ___?___
5. For acute angles, what trigonometric ratios have values between 0 and 1?
6. What trigonometric ratio can have values greater than 1?