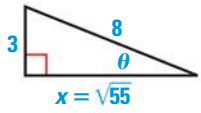
EXAMPLE 2 TAKS PRACTICE: Multiple Choice

If θ is an acute angle of a right triangle and $\sin\theta = \frac{3}{8}$, what is $\tan\theta$?

Ⓐ $\frac{3\sqrt{55}}{55}$ Ⓑ $\frac{1}{2}$ Ⓒ $\frac{\sqrt{55}}{8}$ Ⓓ $\frac{8}{3}$

Solution

STEP 1 **Draw** a right triangle with acute angle θ such that the leg opposite θ has length 3 and the hypotenuse has length 8. By the Pythagorean theorem, the length x of the other leg is $x = \sqrt{8^2 - 3^2} = \sqrt{55}$.



STEP 2 **Find** the value of $\tan\theta$.

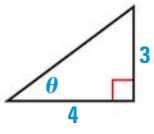
$$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{3}{\sqrt{55}} = \frac{3\sqrt{55}}{55}$$

▶ The correct answer is A. Ⓐ Ⓑ Ⓒ Ⓓ

GUIDED PRACTICE for Examples 1 and 2

Evaluate the six trigonometric functions of the angle θ.

1.



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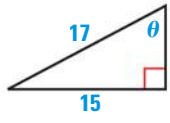

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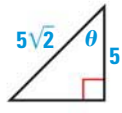


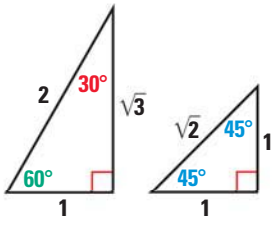
4. In a right triangle, θ is an acute angle and $\cos\theta = \frac{7}{10}$. What is $\sin\theta$?

SPECIAL ANGLES The angles 30°, 45°, and 60° occur frequently in trigonometry. You can use the trigonometric values for these angles to find unknown side lengths in special right triangles.

KEY CONCEPT *For Your Notebook*

Trigonometric Values for Special Angles

The table below gives the values of the six trigonometric functions for the angles 30°, 45°, and 60°. You can obtain these values from the triangles shown.



θ	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\csc\theta$	$\sec\theta$	$\cot\theta$
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	2	$\frac{2\sqrt{3}}{3}$	$\sqrt{3}$
45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	$\sqrt{2}$	$\sqrt{2}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	2	$\frac{\sqrt{3}}{3}$