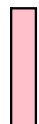
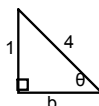


Trigonometric Identities

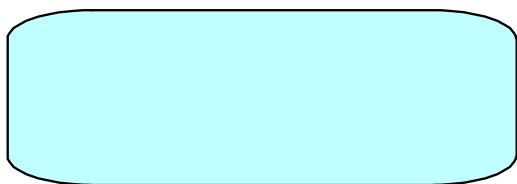
Example 3 Using a right triangle

a. Find the exact value of $\cos \theta$ if $\sin \theta = \frac{1}{4}$

i. Find the missing side of the right triangle that has the given sine ratio.

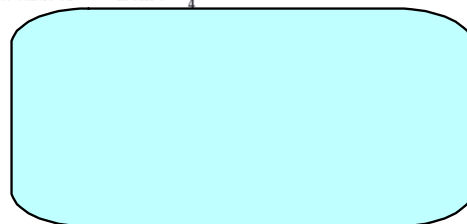
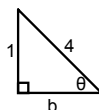


ii. Find the cosine ratio.



Example 4 Using a right triangle

a. Find the exact value of $\tan \theta$ if $\sin \theta = \frac{1}{4}$



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

Pythagorean Identities

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

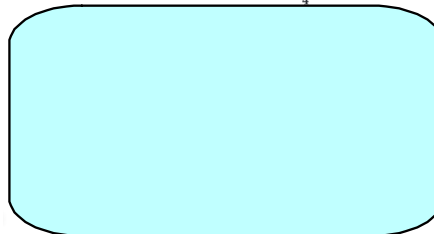
$$1 + \cot^2 \theta = \csc^2 \theta$$

Tangent and Cotangent Identities

$$\tan \theta = \frac{\sin \theta}{\cos \theta} \qquad \cot \theta = \frac{\cos \theta}{\sin \theta}$$

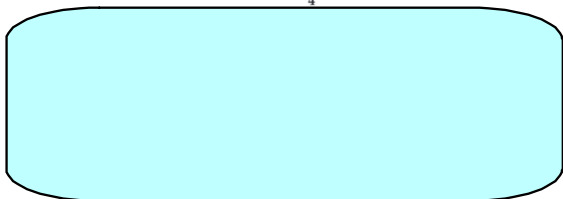
Example 1 Use Trigonometric Identities

a. Find the exact value of $\cos \theta$ if $\sin \theta = \frac{1}{4}$



Example 2 Use Trigonometric Identities

a. Find the exact value of $\tan \theta$ if $\sin \theta = \frac{1}{4}$



Find the exact value of each expression if $0^\circ < \theta < 90^\circ$.

1. ~~$\cos \theta = 2$, find $\tan \theta$.~~

2. If $\sin \theta = \frac{4}{5}$, find $\cos \theta$.

3. If $\cos \theta = \frac{2}{3}$, find $\sin \theta$.

4. If $\cos \theta = \frac{2}{3}$, find $\tan \theta$.

5. If $\sin \theta = \frac{4}{5}$, find $\tan \theta$.

~~$\cos \theta = 2$, find $\tan \theta$.~~

~~$\cos \theta = 2$, find $\tan \theta$.~~