

Probability of being hit by lightning

$$= 1/576\,000$$

Probability of drowning in a bathtub

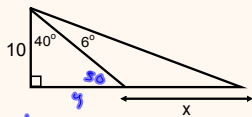
$$= 1/685\,000$$

MBF 3C
4.1

Chapter 4 Trigonometry Special Angles

SOH CAH TOA

Determine the length of x in the following diagram.



$$\tan 40^\circ = \frac{y}{10}$$

$$10 \tan 40^\circ = y$$
$$y = 8.391$$

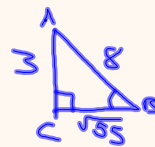
$$\tan 46^\circ = \frac{L}{10}$$

$$10 \tan 46^\circ = L$$
$$10 \cdot 1.0355 = L$$
$$L = 10.355$$

$$x = 10.355 - 8.391$$

Exact Values

In $\triangle ABC$, if $\sin B = 3/8$,
then determine the exact value of $\cos B$.



$$\cos B = \frac{\sqrt{55}}{8}$$

$$8^2 = 3^2 + a^2$$
$$64 - 9 = a^2$$
$$55 = a^2$$
$$\sqrt{55} = a$$

Special Angles

Usually when we evaluate a basic trig ratio, we get an inexact answer.

eg. $\sin 75^\circ = 0.9659$

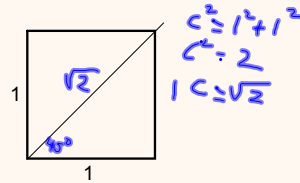
But sometimes it is possible to record these answers in exact form.

Exact Form $\sin 75^\circ = \frac{\sqrt{2} + \sqrt{6}}{4}$

45° Angles

Consider a square with side length 1 cm.

0.707

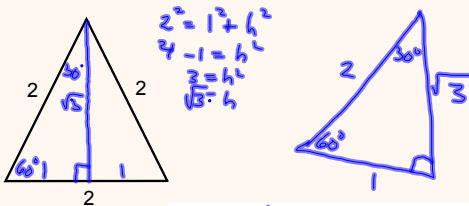


Special Angles

$\sin 45^\circ$	$\cos 45^\circ$	$\tan 45^\circ$
$= \frac{1}{\sqrt{2}}$	$= \frac{1}{\sqrt{2}}$	$= 1$

30° and 60° Angles

Consider an equilateral triangle with side length 2 cm.

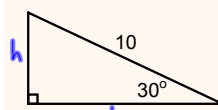


Special Angles

$\sin 30^\circ = \frac{1}{2}$	$\cos 30^\circ = \frac{\sqrt{3}}{2}$	$\tan 30^\circ = \frac{1}{\sqrt{3}}$
$\sin 60^\circ = \frac{\sqrt{3}}{2}$	$\cos 60^\circ = \frac{1}{2}$	$\tan 60^\circ = \sqrt{3}$

Area of a Triangle

Determine the area of the triangle.



Handwritten calculations:

$$A = \frac{bh}{2}$$

$$\sin 30^\circ = \frac{h}{10}$$

$$\frac{1}{2} = \frac{h}{10}$$

$$\boxed{5 = h}$$

$$\cos 30^\circ = \frac{b}{10}$$

$$\frac{\sqrt{3}}{2} = \frac{b}{10}$$

$$\frac{10\sqrt{3}}{2} = b$$

$$5\sqrt{3} = b$$

$$\text{Area} = \frac{(5\sqrt{3})(5)}{2}$$

$$= \frac{25\sqrt{3}}{2}$$

Simplify

$$\begin{aligned} & \cos^2 45^\circ + \sin^2 45^\circ \\ & (\cos 45^\circ)^2 + (\sin 45^\circ)^2 \\ & \left(\frac{1}{\sqrt{2}}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^2 \end{aligned}$$

$$= \frac{1}{2} + \frac{1}{2}$$

$$= 1$$

$\left. \begin{array}{l} \cos^2 45^\circ \\ = (\cos 45^\circ)(\cos 45^\circ) \\ \cancel{\cos 45^\circ} \end{array} \right\}$

Homework:

Worksheet