

## BIG IDEAS

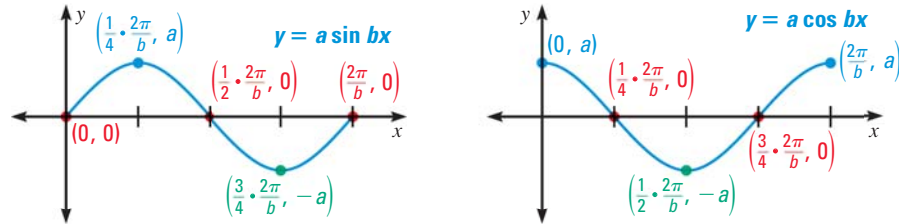
For Your Notebook

### Big Idea 1

TEKS a.5

### Graphing Trigonometric Functions

The graphs of  $y = a \sin bx$  and  $y = a \cos bx$  are shown below for  $a > 0$  and  $b > 0$ .



To graph a function of the form  $y = a \sin b(x - h) + k$  or  $y = a \cos b(x - h) + k$ , shift the graph of  $y = a \sin bx$  or  $y = a \cos bx$ , respectively, horizontally  $h$  units and vertically  $k$  units. Then, if  $a < 0$ , reflect the graph in the midline  $y = k$ .

### Big Idea 2

TEKS 2A.2.A

### Solving Trigonometric Equations

The table below shows strategies that may help you solve trigonometric equations. Only the first few steps are shown.

Factor	Use the quadratic formula	Use an identity
$x \sin^2 x - x = 0$	$\cos^2 x - 6 \cos x + 1 = 0$	$\cos^2 x - 1 = 9 \sin^2 x$
$x(\sin^2 x - 1) = 0$	$\cos x = \frac{6 \pm \sqrt{36 - 4(1)(1)}}{2(1)}$	$\cos^2 x - 1 = 9(1 - \cos^2 x)$
$x(\sin x + 1)(\sin x - 1) = 0$	$\cos x = 3 \pm 2\sqrt{2}$	$10 \cos^2 x = 10$
		$\cos^2 x = 1$

### Big Idea 3

TEKS 2A.2.A

### Applying Trigonometric Formulas

Use the formulas below to evaluate trigonometric functions of certain angles.

<b>Sum formulas</b>	$\sin(a + b) = \sin a \cos b + \cos a \sin b$ $\cos(a + b) = \cos a \cos b - \sin a \sin b$	$\tan(a + b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$
<b>Difference formulas</b>	$\sin(a - b) = \sin a \cos b - \cos a \sin b$ $\cos(a - b) = \cos a \cos b + \sin a \sin b$	$\tan(a - b) = \frac{\tan a - \tan b}{1 + \tan a \tan b}$
<b>Double-angle formulas</b>	$\cos 2a = \cos^2 a - \sin^2 a$ $\cos 2a = 2 \cos^2 a - 1$ $\cos 2a = 1 - 2 \sin^2 a$ $\sin 2a = 2 \sin a \cos a$	$\tan 2a = \frac{2 \tan a}{1 - \tan^2 a}$
<b>Half-angle formulas</b>	$\sin \frac{a}{2} = \pm \sqrt{\frac{1 - \cos a}{2}}$ $\cos \frac{a}{2} = \pm \sqrt{\frac{1 + \cos a}{2}}$	$\tan \frac{a}{2} = \frac{1 - \cos a}{\sin a}$ $\tan \frac{a}{2} = \frac{\sin a}{1 + \cos a}$