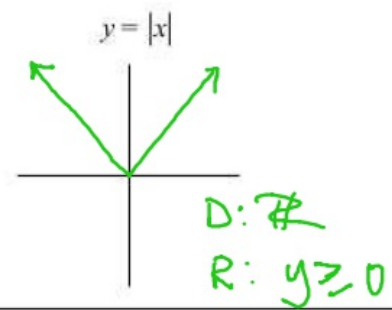
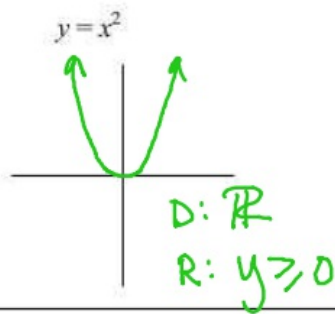
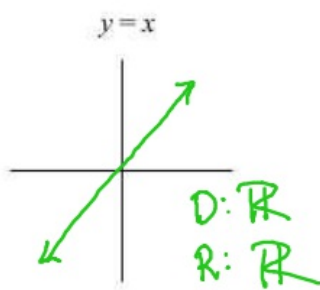
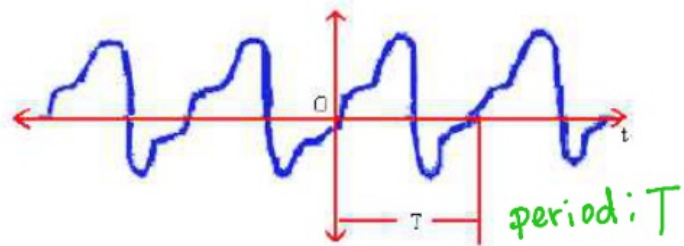


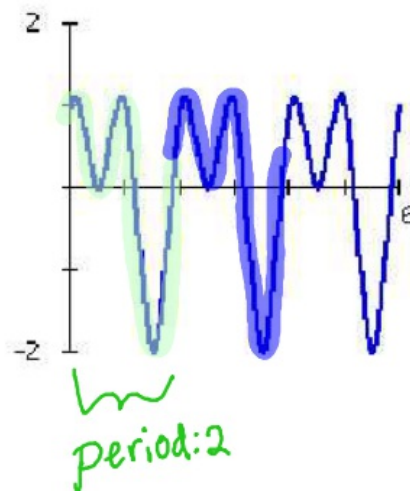
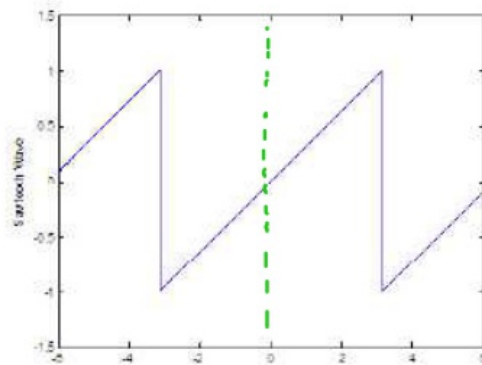
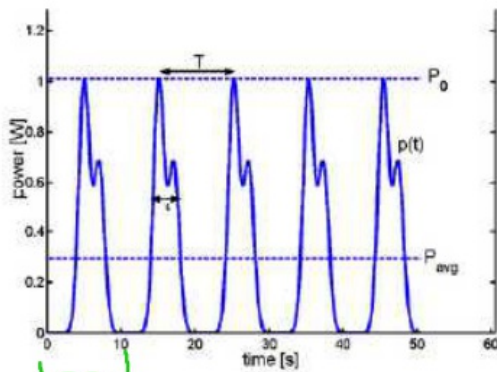
Functions we have worked with so far . . .



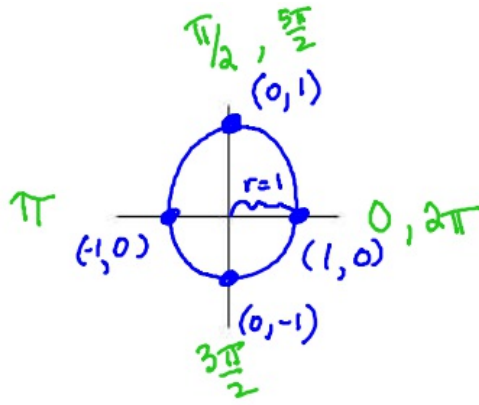
Periodic Functions



Determine the period for each graph



Review



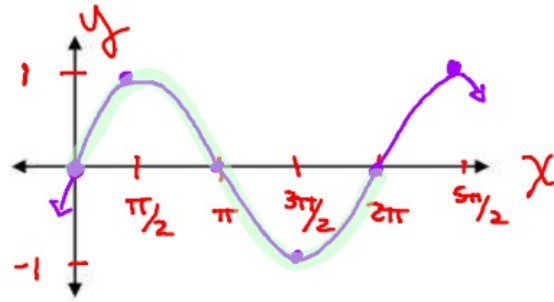
$$\sin \theta = \frac{y}{r} = \frac{\text{opp}}{\text{hyp}}$$

$$\cos \theta = \frac{x}{r}$$

Complete the chart, then graph *one period* of the function.

$$y = \sin x$$

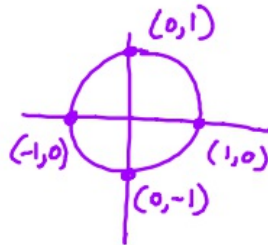
x	$\neq \sin x$
0	$\frac{y}{r} = \frac{0}{1} = 0$
$\pi/2$	$\frac{1}{1} = 1$
π	$\frac{0}{1} = 0$
$3\pi/2$	$\frac{-1}{1} = -1$
2π	$\frac{0}{1} = 0$
$5\pi/2$	$\frac{1}{1} = 1$



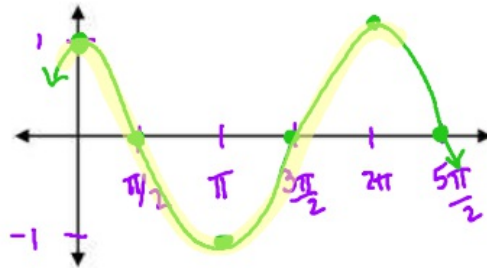
Domain: \mathbb{R}

Range: $-1 \leq y \leq 1$

$$y = \cos x$$



x	$\neq \cos x$
0	$\frac{x}{r} = \frac{1}{1} = 1$
$\pi/2$	$\frac{0}{1} = 0$
π	$\frac{-1}{1} = -1$
$3\pi/2$	$\frac{0}{1} = 0$
2π	$\frac{1}{1} = 1$
$5\pi/2$	$\frac{0}{1} = 0$



Domain: \mathbb{R}

Range: $-1 \leq y \leq 1$

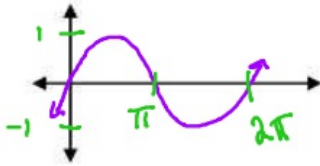
Parent Graphs

Teacher's Copy

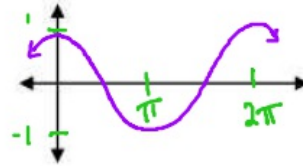
Note:

The book uses $y = \sin \theta$

$y = \sin x$



$y = \cos x$



Transformations of the sine and cosine functions

$y = a \sin bx$

$y = a \cos bx$

$|a|$: amplitude

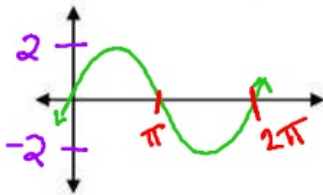
$\frac{2\pi}{|b|}$: period

Graph each function (one period)

1. $y = 2\sin x$

amplitude: 2

period: $\frac{2\pi}{1} = 2\pi$



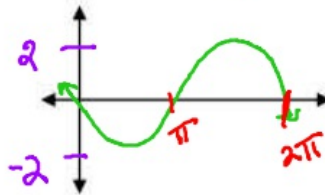
D: \mathbb{R}

R: $-2 \leq y \leq 2$

2. $y = -2\sin x$

amplitude: 2 (reflection)

period: $\frac{2\pi}{1} = 2\pi$



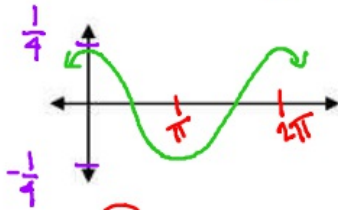
D: \mathbb{R}

R: $-2 \leq y \leq 2$

3. $y = \frac{1}{4} \cos x$

amplitude: $\frac{1}{4}$

period: $\frac{2\pi}{1} = 2\pi$



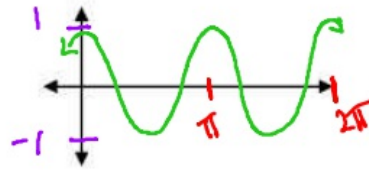
D: \mathbb{R}

R: $-\frac{1}{4} \leq y \leq \frac{1}{4}$

4. $y = \cos 2x$

amplitude: 1

period: $\frac{2\pi}{2} = \pi$



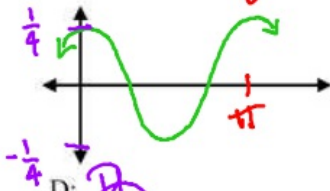
D: \mathbb{R}

R: $-1 \leq y \leq 1$

5. $y = \frac{1}{4} \cos 2x$

amplitude: $\frac{1}{4}$

period: $\frac{2\pi}{2} = \pi$



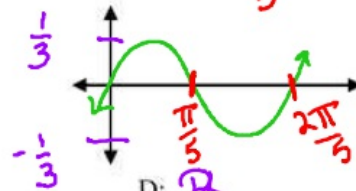
D: \mathbb{R}

R: $-\frac{1}{4} \leq y \leq \frac{1}{4}$

6. $y = \frac{1}{3} \sin 5x$

amplitude: $\frac{1}{3}$

period: $\frac{2\pi}{5}$



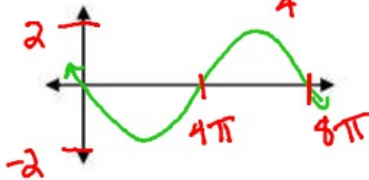
D: \mathbb{R}

R: $-\frac{1}{3} \leq y \leq \frac{1}{3}$

7. $y = -2 \sin \frac{1}{4} x$

amplitude: 2 (reflection)

period: $\frac{2\pi}{\frac{1}{4}} = \frac{2\pi}{1} \cdot \frac{4}{1} = 8\pi$



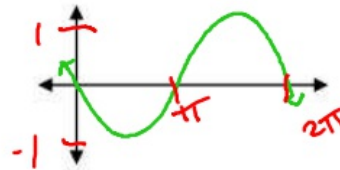
D: \mathbb{R}

R: $-2 \leq y \leq 2$

8. $y = -\sin x$

amplitude: 1 (reflection)

period: 2π



D: \mathbb{R}

R: $-1 \leq y \leq 1$

Homework

Page 760: 1 - 8 all

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