Algebra 2
Intro to Trig Graphs

Name: _____
(Alg 2 Supp13.6 & 14.1)

Objective: To construct the parent graphs of trigonometric functions for sine, cosine, and tangent using exact values.

Complete the following table for $sin\ \theta$. Find the values of $sin\ \theta$ for each angle.

θ (degree) x	0° (0π)	30°	45°	60°	90° (π/2)	120°	135°	150°	180° (π)
sin θ (nearest tenth), y	0/1 → 0	1/2 → .5	√2/2 → .71	√3/2 → .87	1/1 → 1	√3/2 → .87	√2/2 → .71	1/2 → .5	0/1 → 0

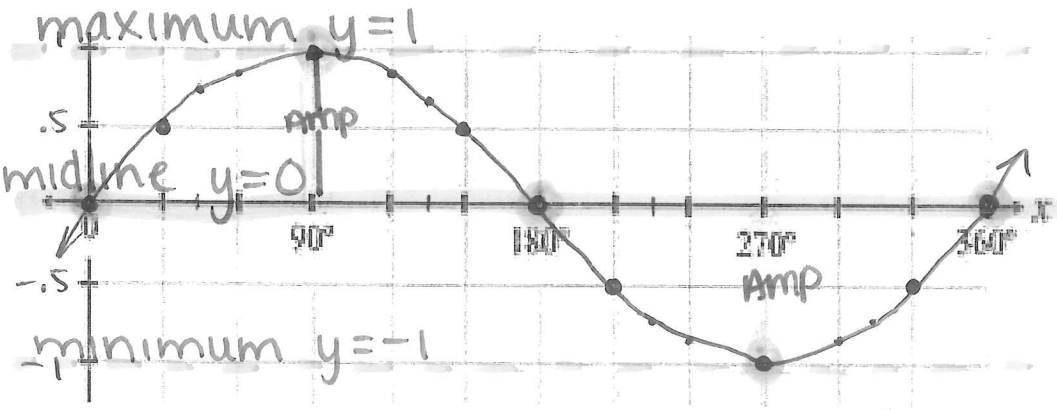
θ (degree) x	210°	225°	240°	270° (3π/2)	300°	315°	330°	360° (2π)	390°
sin θ (nearest tenth), y	-1/2 → -.5	-√2/2 → -.71	-√3/2 → -.87	-1/1 → -1	-√3/2 → -.87	-√2/2 → -.71	-1/2 → -.5	0/1 → 0	1/2 → .5

To graph the function $y = sin\ \theta$, use values of θ expressed in either degrees or radians. These values represent the x values on a graph. Use the values of $sin\ \theta$ expressed as a value rounded to the nearest tenth to represent the y values on the graph.

Ordered pairs for points on these graphs are of the form $(\theta, sin\ \theta)$. (0,0) (30,.5) (45,.71) (60,.87) (90,1) ⋮

On the graph below, plot the points, $(\theta, sin\ \theta)$. Connect the points with a smooth curve. This graph represents the graph of the sine function.

$y = sin\ \theta$ ⇒ starts at midline



5 Key Pts
1. midline
2. max
3. midline
4. min
5. midline

- Period: one complete cycle of graph ⇒ 360° or 2π
- Amplitude: height/distance from midline to max/min ⇒ Amp. = 1

Complete the following table for $\cos\theta$. Find the values of $\cos\theta$ for each angle.

θ (degree) x	0^o 0π	30^o	45^o	60^o	90^o $\pi/2$	120^o	135^o	150^o	180^o π
$\cos\theta$ (nearest tenth), y	$1/1$ 1	$\sqrt{3}/2$ .87	$\sqrt{2}/2$ .71	$1/2$ .5	$0/1$ 0	$-1/2$ -.5	$-\sqrt{2}/2$ -.71	$-\sqrt{3}/2$ -.87	$-1/1$ -1

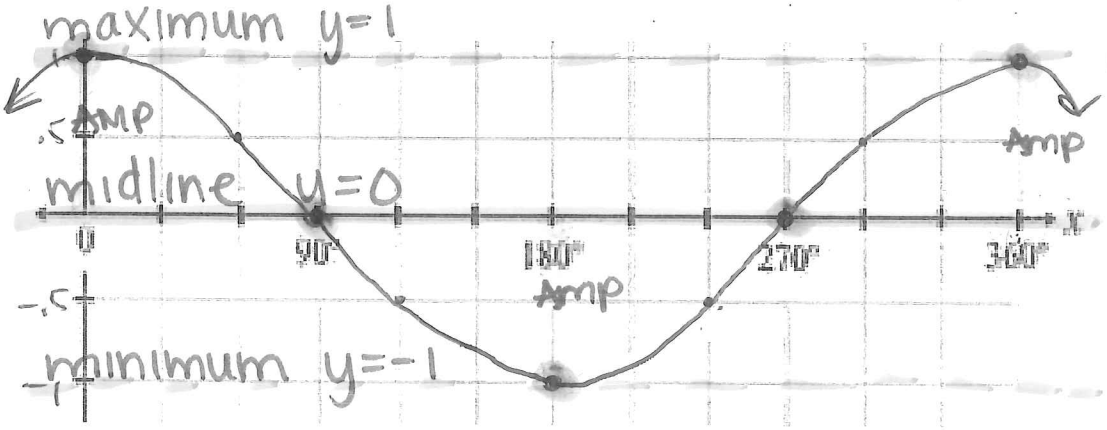
θ (degree) x	210^o	225^o	240^o	270^o $3\pi/2$	300^o	315^o	330^o	360^o 2π	390^o
$\cos\theta$ (nearest tenth), y	$-\sqrt{3}/2$ -.87	$-\sqrt{2}/2$ -.71	$-1/2$ -.5	$0/1$ 0	$1/2$ .5	$\sqrt{2}/2$ .71	$\sqrt{3}/2$ .87	$1/1$ 1	$\sqrt{3}/2$ .87

To graph the function $y = \cos\theta$, use values of θ expressed in either degrees or radians. These values represent the x values on a graph. Use the values of $\cos\theta$ expressed as a value rounded to the nearest tenth to represent the y values on the graph.

Ordered pairs for points on these graphs are of the form $(\theta, \cos\theta)$.

On the graph below, plot the points, $(\theta, \cos\theta)$. Connect the points with a smooth curve. This graph represents the graph of the cosine function.

$y = \cos\theta$ ⇒ starts at maximum



5 Key pts
1. max
2. midline
3. min
4. midline
5. max

- Period: one complete cycle 360° or 2π
- Amplitude: 1

$\rightarrow \tan\theta = \frac{\sin\theta}{\cos\theta}$

Complete the following table for $tan\ \theta$. Find the values of $tan\ \theta$ for each angle.

θ (degree) x	0^o	30^o	45^o	60^o	90^o	120^o	135^o	150^o	180^o
tan θ (nearest tenth), y	$0/1$ 0	$1/2 \div \sqrt{3}/2$ $\frac{\sqrt{3}}{3} = .58$	$\frac{\sqrt{2}}{2} \div \frac{\sqrt{2}}{2}$ 1	$\frac{\sqrt{3}}{2} \div 1/2$ $\sqrt{3} = 1.73$	$1/0$ und.	$\frac{\sqrt{3}}{2} \div -\frac{1}{2}$ $-\sqrt{3} = -1.73$	$\frac{\sqrt{2}}{2} \div -\frac{\sqrt{2}}{2}$ -1	$\frac{1}{2} \div -\frac{\sqrt{3}}{2}$ $-\frac{\sqrt{3}}{3} = -.58$	$0/-1$ 0

θ (degree) x	210^o	225^o	240^o	270^o	300^o	315^o	330^o	360^o	390^o
tan θ (nearest tenth), y	$-\frac{1}{2} \div -\frac{\sqrt{3}}{2}$ $\frac{\sqrt{3}}{3} = .58$	$-\frac{\sqrt{2}}{2} \div -\frac{\sqrt{2}}{2}$ 1	$-\frac{\sqrt{3}}{2} \div -\frac{1}{2}$ $\sqrt{3} = 1.73$	$-1/0$ und.	$-\frac{\sqrt{3}}{2} \div \frac{1}{2}$ $-\sqrt{3} = -1.73$	$-\frac{\sqrt{2}}{2} \div \frac{\sqrt{2}}{2}$ -1	$-\frac{1}{2} \div \frac{\sqrt{3}}{2}$ $-\frac{\sqrt{3}}{3} = -.58$	$0/1$ 0	$1/2 \div \sqrt{3}/2$ $\frac{\sqrt{3}}{3} = .58$

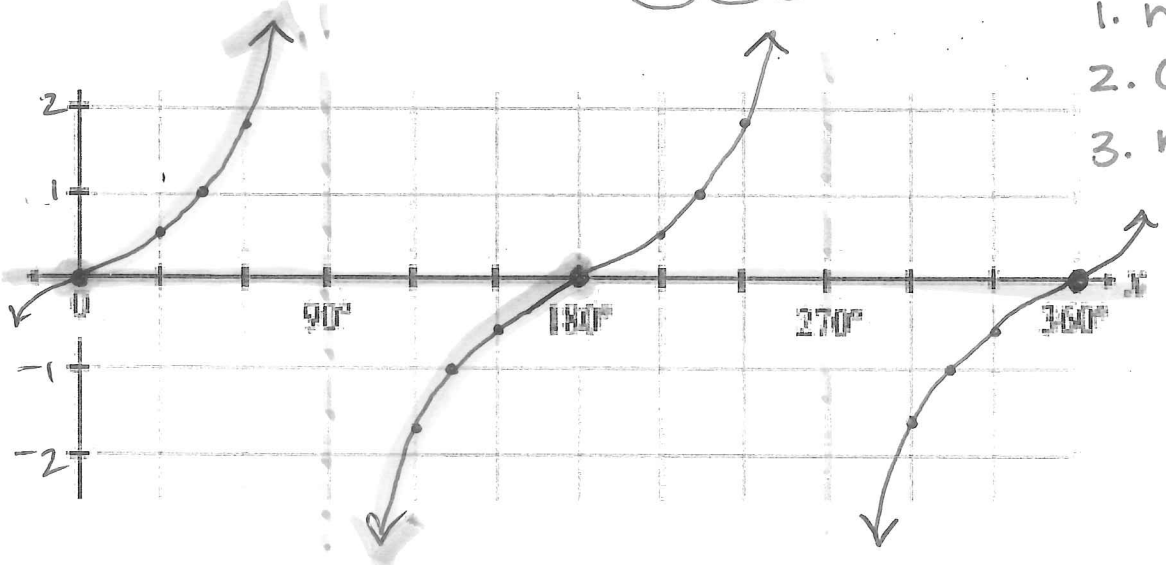
To graph the function $y = tan\ \theta$, use values of θ expressed in either degrees or radians. These values represent the x values on a graph. Use the values of $tan\ \theta$ expressed as a value rounded to the nearest tenth to represent the y values on the graph.

Ordered pairs for points on these graphs are of the form $(\theta, tan\ \theta)$.

On the graph below plot the points, $(\theta, tan\ \theta)$. Connect the points with a smooth curve, but there should be breaks in the graph where there is an "error" or undefined value. This graph represents the graph of the tangent function.

$y = tan\ \theta$

3 Key pts
1. midline (inc.)
2. asymptote
3. midline (dec.)



- Period: 180° or π ⇒ one complete cycle
- No Amplitude: no max or min
- Asymptotes occur at undefined values