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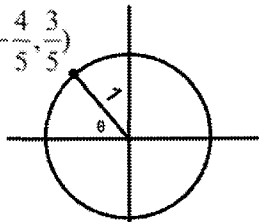
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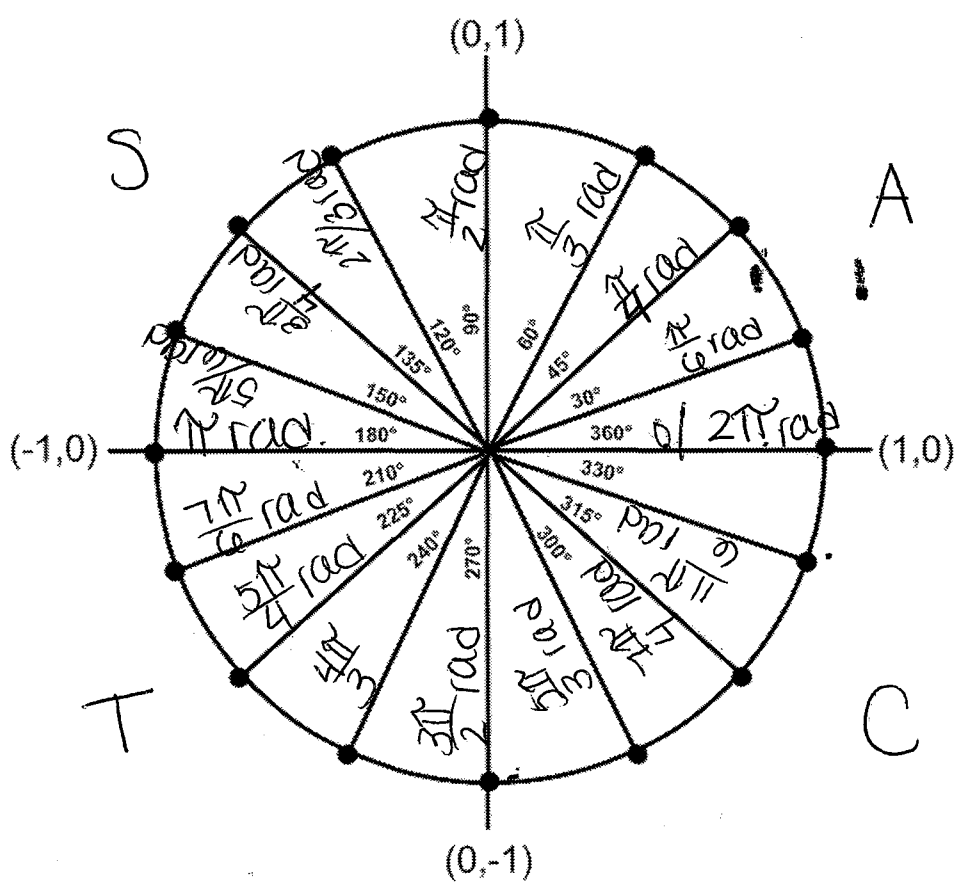
TROICI

LESSON #1: GRAPHING SINE AND COSINE

Do Now:

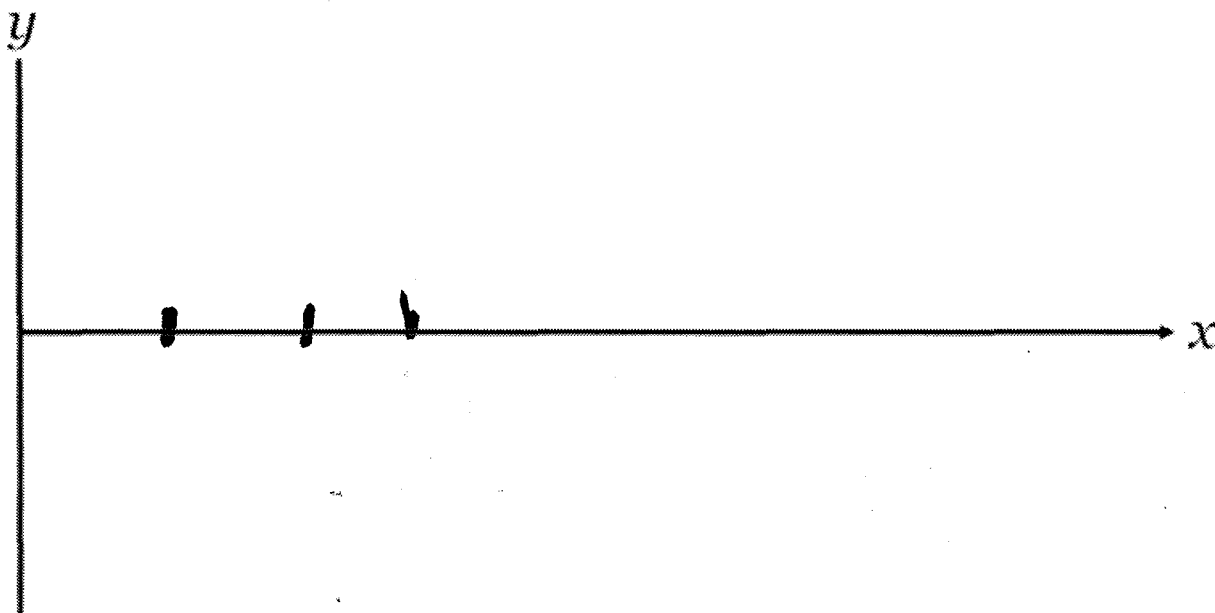
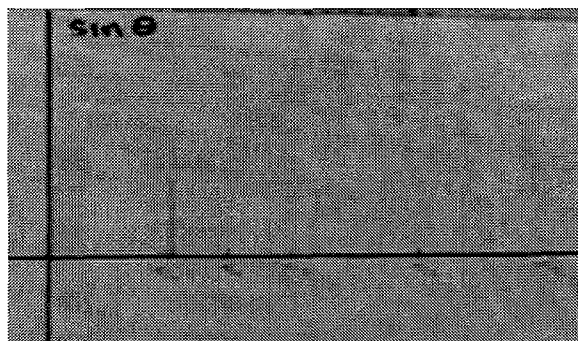
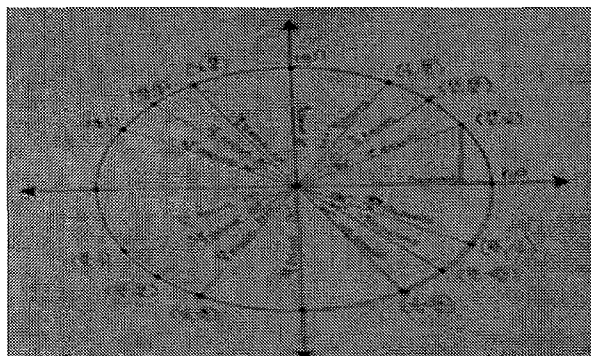
<p>1. What are the sine and cosine of this angle?</p> <div style="text-align: center;"> <p>CS</p> <p>$(-\frac{4}{5}, \frac{3}{5})$</p>  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>$\cos \theta = -\frac{4}{5}$</p> <p>$\sin \theta = \frac{3}{5}$</p> </div>	<p>2. How do we convert 60° to radians? (DR POT!)</p> <div style="text-align: center; margin-top: 20px;"> $60^\circ \cdot \frac{\pi}{180^\circ} = \boxed{\frac{1\pi}{3}}$ </div>	<p>3. How do we convert $\frac{\pi}{4}$ radians to degrees?</p> <div style="text-align: center; margin-top: 20px;"> $\frac{\pi}{4} \cdot \frac{180}{\pi} = \boxed{45^\circ}$ </div>
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Convert all degrees in the unit circle below to radian measure:



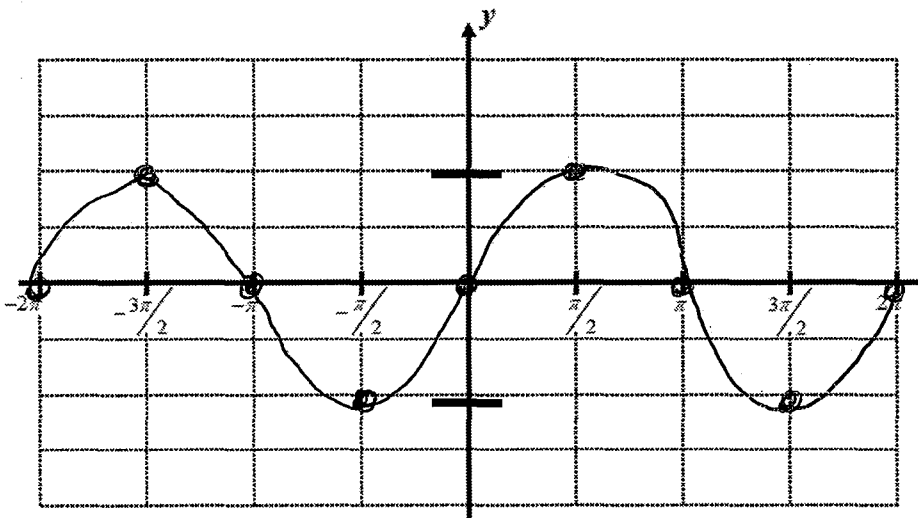
GRAPHING SINE AND COSINE PASTA ACTIVITY

1. Wrap a piece of yarn around the unit circle starting at 0 radians.
2. With your marker, indicate each place where the yarn hits an angle.
3. Lay the start of your yarn on the origin and label all angles from 0 to 2π
4. Use your pasta to measure each angle (from the point to the x-axis- think making right triangles)
5. Break off pasta and glue to the graph below.
6. All positive angles are above the x-axis, all negative angles are below the x-axis (be careful with your signs! ASTC!)
7. Start the process for the graph of $y = \sin\theta$ then repeat for the graph of $y = \cos\theta$



By using the table below, graph the **SINE CURVE** from $-2\pi \leq x \leq 2\pi$.

(Degrees)	-360°	-270°	-180°	-90°	0	90°	180°	270°	360°
x	-2π	$-\frac{3\pi}{2}$	$-\pi$	$-\frac{\pi}{2}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
(radians)		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{2}{2}$	
$\sin(x)$	0	1	0	-1	0	1	0	-1	0



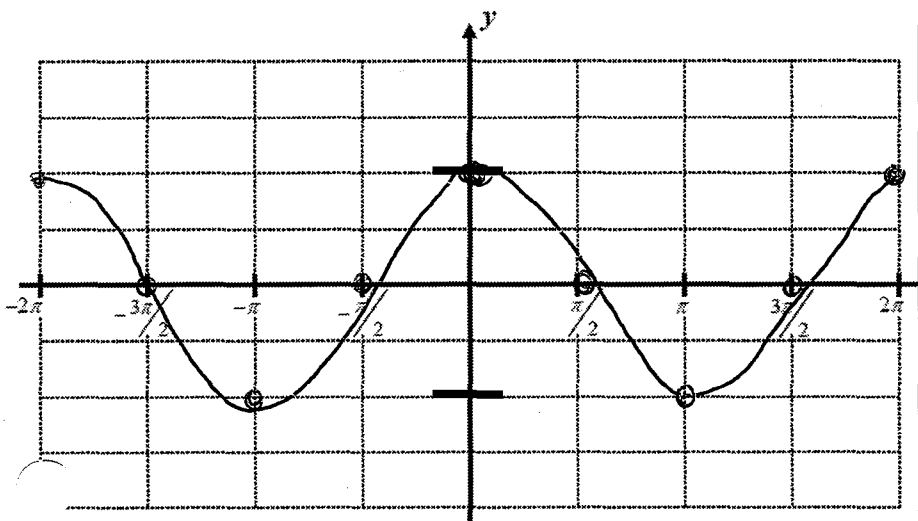
Important Notes for the Sine Curve:

★ Starts @ 0!

- Cyclic, periodic, oscillates
- $y = \sin x$ is reflected over the origin
(odd function)
- Sine function is Positive in Q I & Q II
- 1 Full sine wave $[0, 2\pi]$

By using the table below, graph the **COSINE CURVE** from $-2\pi \leq x \leq 2\pi$.

(Degrees)	-360°	-270°	-180°	-90°	0	90°	180°	270°	360°
x	-2π	$-\frac{3\pi}{2}$	$-\pi$	$-\frac{\pi}{2}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
(radians)		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{2}{2}$	
$\cos(x)$	1	0	-1	0	1	0	-1	0	1



Important Notes for the Cosine Curve

★ Starts @ 1!

- Cyclic, periodic, oscillates
- $y = \cos x$ is reflected over the y-axis
(even)
- Cosine function is Positive in Q I & Q IV
- 1 Full Cosine wave $[0, 2\pi]$

$\sin \theta = \text{odd}$, $\cos \theta = \text{even}$

$$\cos \theta = \sin \left(\theta + \frac{\pi}{2} \right)$$

DISCUSSION:

1. Discuss the similarities and differences of the sine and cosine curves

- same graph ~~but~~ when $\sin \theta$ is shifted to the ~~left~~ ~~right~~ 90°
- same interval of 2π for 1 full wave
- same domain + range
- $\sin \theta$ starts @ 0, $\cos \theta$ starts @ 1

o m G
(OFUNCTION)

2. State the domain & range for $y = \sin x$ and $y = \cos x$.

Domain: $(-\infty, \infty)$

Range: $[-1, 1]$

<https://www.youtube.com/watch?v=Q55T6LeTvsA>

<https://www.youtube.com/watch?v=Ohp6Okk tww>