

Name: Key
 Date: _____
 Block: _____

Check whether your calculator is in degrees/radians!

1. Sketch each angle in standard position and note the quadrant where the angle lies. Label the quadrant angles.

a. $\frac{9\pi}{6} = 1\frac{3}{6}\pi = 1\frac{1}{2}\pi$

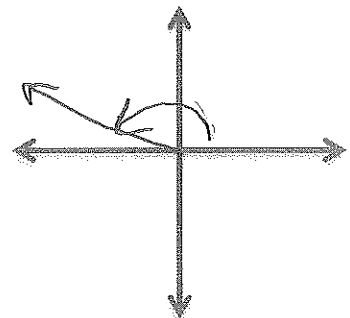
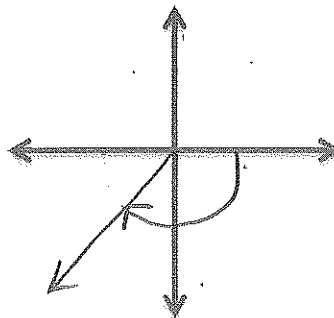
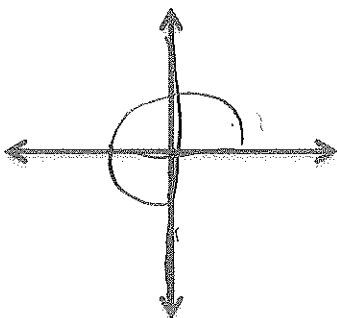
b. -135°

c. $\frac{9\pi}{11}$

Q: Quadrantal

Q: III

Q: II



2. Find one positive and one negative coterminal angle for the given angles.

Show all work!

a. 72°
 $\frac{+360^\circ}{432^\circ}$

72°
 $\frac{-360^\circ}{-288^\circ}$

$+360^\circ$
 $+2\pi$

b. $\frac{5\pi}{4}$
 $\frac{+2\pi = \frac{8\pi}{4}}{13\pi/4}$

$\frac{5\pi}{4}$
 $\frac{-2\pi = -\frac{8\pi}{4}}{-3\pi/4}$

Pos: 432° Neg: -288°

Pos: $\frac{13\pi}{4}$ Neg: $-\frac{3\pi}{4}$

3. Convert from degrees to radians: 315° . Leave your answer in terms of pi.

$$\frac{315^\circ}{1} \cdot \frac{\pi}{180^\circ} = \frac{315\pi}{180} = \frac{7\pi}{4}$$

4. Convert from radians to degrees: $\frac{5\pi}{3}$. Show all work.

$$\frac{5\pi}{3} \cdot \frac{180}{\pi} = \frac{900}{3} = 300^\circ$$

5. State the complement and supplement of each angle if it exists.
Show how you got your answers!

a. 105°

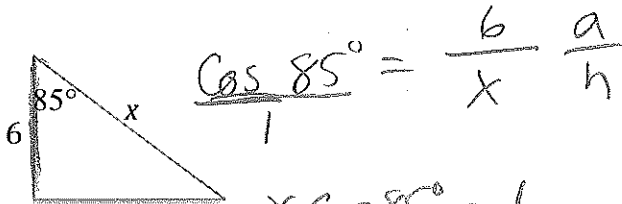
b. $\frac{7\pi}{20}$

c: Not Possible s: 75°

c: $\frac{3\pi}{20}$ s: $\frac{13\pi}{20}$

6. Find the indicated side or angle in the right triangles below.

a.



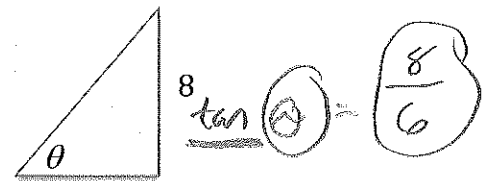
$$\cos 85^\circ = \frac{6}{x} \quad \frac{a}{h}$$

$$x \cos 85^\circ = 6$$

$$x = \frac{6}{\cos 85^\circ}$$

$$x = 68.8$$

b.

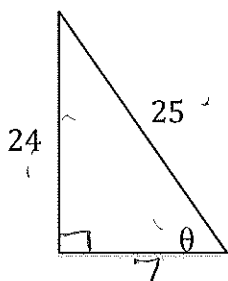


$$\tan \theta = \frac{8}{6}$$

$$\tan^{-1} \frac{8}{6} = \theta$$

$$53.1^\circ = \theta$$

7. Find the exact values (simplest radical form) of the six trigonometric functions for θ .



$$\sin \theta = \frac{24}{25}$$

$$\cos \theta = \frac{7}{25}$$

$$\tan \theta = \frac{24}{7}$$

$$\csc \theta = \frac{25}{24}$$

$$\sec \theta = \frac{25}{7}$$

$$\cot \theta = \frac{7}{24}$$

8. State the amplitude, period, and vertical shift of each of the following equations. Include the direction of the shifts.

a. $y = \sin(3x) + 4$

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

Amplitude: 1

Amplitude: 4

Period: $\frac{2\pi}{b} = \frac{2\pi}{3}$

Period: $\frac{2\pi}{\frac{1}{3}} = \frac{2\pi}{1} \cdot \frac{3}{1} = 6\pi$

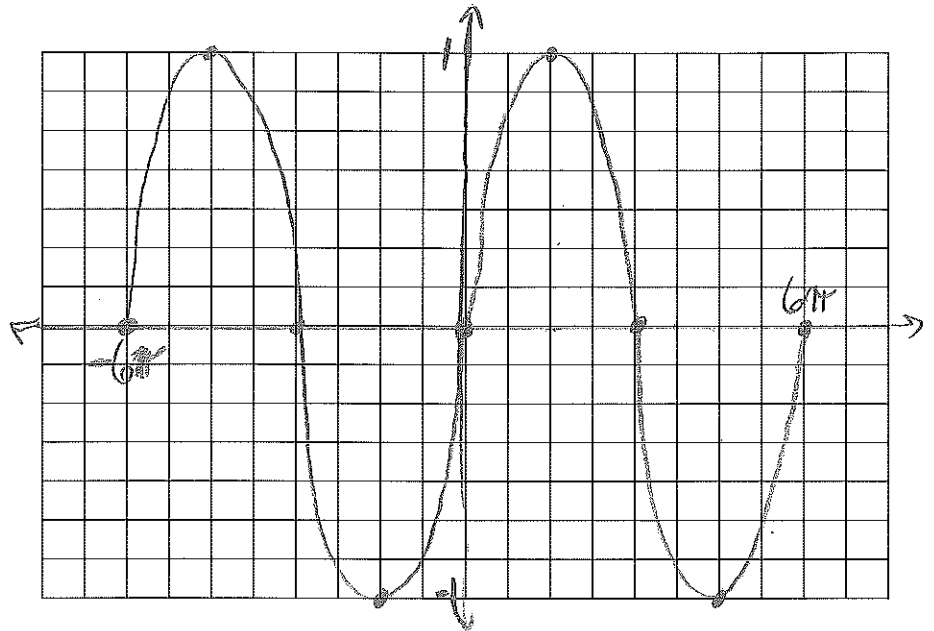
Vertical shift: up, 4

Vertical shift: None

9. Sketch the graphs of the following trigonometric functions. Be sure to include correct labels on both axes. You must graph at least one period on the left and right side of the origin.

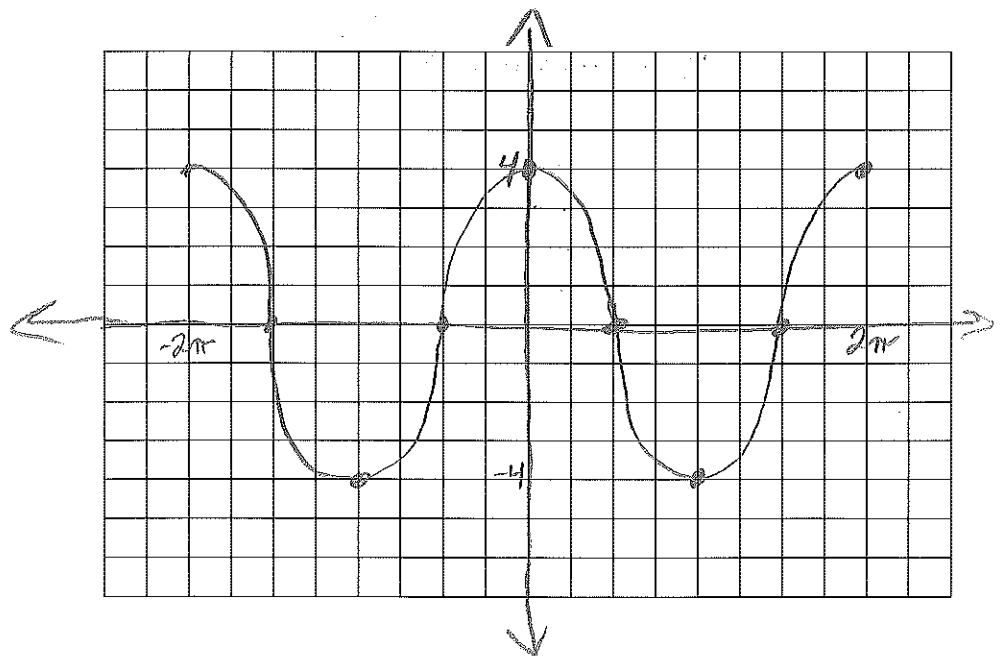
a. $y = \sin \frac{1}{3}x$

Period: $\frac{2\pi}{\frac{1}{3}} = 6\pi$



b. $y = 4 \cos x$

Period: $\frac{2\pi}{1}$



10. Determine the **exact value** of each expression (if it is originally in radians, work in radians; if it is originally in degrees, work it degrees). Leave your answer in simplest radical form.

a) $\sin(300^\circ)$

Reference Angle: 60°

Quadrant: IV

Sign (+/-): $-$

Final Answer: $-\frac{\sqrt{3}}{2}$

b) $\cos\frac{11\pi}{6}$

Reference Angle: $\frac{\pi}{6}$

Quadrant: IV

Sign (+/-): $+$

Final Answer: $\frac{\sqrt{3}}{2}$

c) $\tan\left(\frac{4\pi}{3}\right)$

Reference Angle: $\frac{\pi}{3}$

Quadrant: III

Sign (+/-): $+$

Final Answer: $\sqrt{3}$

d) $\csc 30^\circ$

Reference Angle: 30°

Quadrant: I

Sign (+/-): $+$

Final Answer: 2

e) $\cot\left(\frac{5\pi}{6}\right)$

Reference Angle: $\frac{\pi}{6}$

Quadrant: II

Sign (+/-): $-$

Final Answer: $-\sqrt{3}$

f) $\sec(135^\circ)$

Reference Angle: 45°

Quadrant: II

Sign (+/-): $-$

Final Answer: $-\sqrt{2}$

