

Chapter 6 Review and Final Exam Study Guide

Date _____

Convert each degree measure into radians. Leave answers in fraction form.

1) $240^\circ \times \frac{\pi}{180} =$

$$\boxed{\frac{4\pi}{3}}$$

2) $-450^\circ \times \frac{\pi}{180} =$

$$\boxed{-\frac{5\pi}{2}}$$

Convert each radian measure into degrees. (4PTS)

3) $\frac{11\pi}{9} \times \frac{180}{\pi} =$

$$\boxed{220^\circ}$$

4) $-\frac{5\pi}{3} \times \frac{180}{\pi} =$

$$\boxed{-300^\circ}$$

Find the length of each arc. Round your answers to the nearest tenth. Remember to include the correct units.

$$S = r\theta \left(\frac{\pi}{180}\right)$$

5) $r = 9 \text{ yd}, \theta = 300^\circ$

$$\boxed{47.1 \text{ yd}}$$

$$S = 9(300)\left(\frac{\pi}{180}\right) = 47.12$$

6) $r = 13 \text{ yd}, \theta = 90^\circ$

$$\boxed{20.4 \text{ yd}}$$

$$S = 13(90)\left(\frac{\pi}{180}\right) = 20.42$$

Find the area of each sector. Round your answers to tenth. REMEMBER UNITS.

7) $r = 14 \text{ mi}, \theta = 240^\circ$

$$\boxed{410.5 \text{ mi}^2}$$

$$A = \frac{1}{2}(14^2)(240)\left(\frac{\pi}{180}\right)$$

$$A = 410.50$$

$$A = \frac{1}{2}r^2\theta \left(\frac{\pi}{180}\right)$$

8) $r = 15 \text{ ft}, \theta = 75^\circ$

$$\boxed{147.3 \text{ ft}^2}$$

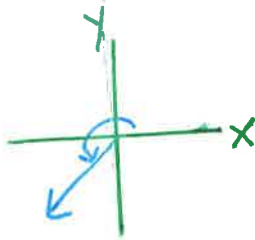
$$A = \frac{1}{2}(15^2)(75)\left(\frac{\pi}{180}\right)$$

$$A = 147.26$$

Sketch the Graph by clearly using an arrow to show the angle location in the appropriate quadrant. You do not need to label the reference angle. Find the exact value of each trigonometric function.

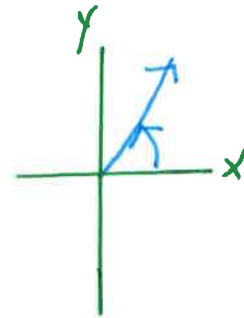
9) $\sin \frac{4\pi}{3} =$

$\frac{\sqrt{3}}{2}$



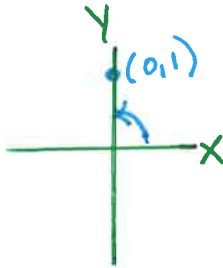
10) $\cos \frac{\pi}{6} =$

$\frac{\sqrt{3}}{2}$



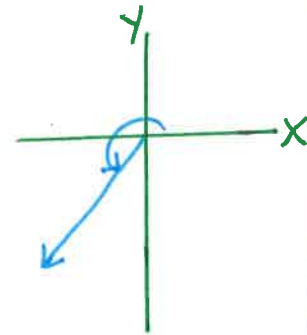
11) $\sin \frac{\pi}{2} =$

1



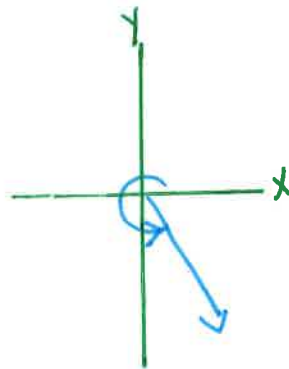
12) $\cos \frac{5\pi}{4} =$

$-\frac{\sqrt{2}}{2}$



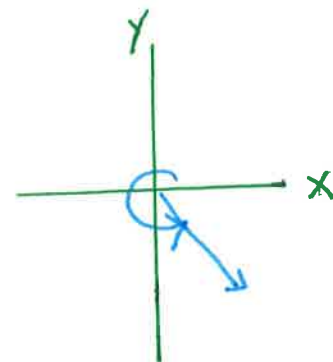
13) $\sin \frac{7\pi}{4} =$

$-\frac{\sqrt{2}}{2}$



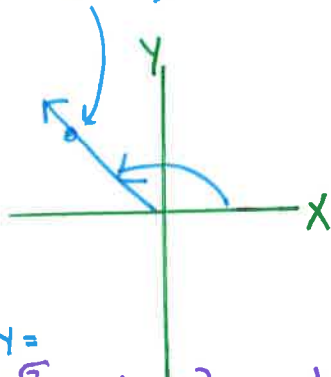
14) $\cos \frac{5\pi}{3} =$

$\frac{1}{2}$



15) $\tan \frac{5\pi}{6} = \frac{y}{x}$

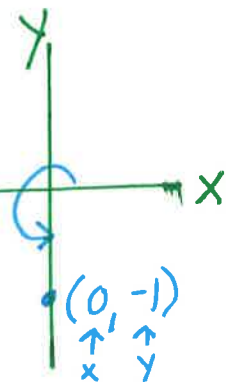
$(-\frac{\sqrt{3}}{2}, \frac{1}{2})$



16) $\tan \frac{3\pi}{2} = \frac{y}{x}$

$= \frac{-1}{0}$

UNDEFINED



$x \div y =$
 $\frac{1}{2} \div \frac{-\sqrt{3}}{2} = \frac{1}{2} \cdot \frac{2}{-\sqrt{3}} = \frac{1}{-\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

NOTES

$\pi = 180$
 $2\pi = 360^\circ$

Positive Angles less than 2π , can be read off the UNIT Circle (cosine, sine)

Sketch the graph- clearly using an arrow to show the angle location in the appropriate quadrant. Then label the reference angle (B) in radians!!!! Find the exact value of each trigonometric function.

17) $\tan \frac{17\pi}{4}$

$\tan \theta = \frac{y}{x}$
 $\frac{\sqrt{2}}{2} \div \frac{\sqrt{2}}{2} = 1$

← divide to see how many rotations
 $= 4.25\pi$
 $2\pi = 360^\circ$
 $= 1 \text{ rotation}$

$B = \frac{\pi}{4}$

18) $\cos -\frac{5\pi}{6}$

$-\frac{\sqrt{3}}{2}$

Students Y A11

$B = \frac{\pi}{6}$

Take Calculus

19) $\tan -\frac{7\pi}{3} = \frac{y}{x} = \frac{\sqrt{3}}{2} \div \frac{1}{2} =$

$= -2\frac{1}{3}\pi$

$B = \frac{\pi}{3}$
 Q4

$\frac{\sqrt{3}}{2} \cdot \frac{2}{1} = \sqrt{3}$

DON'T FORGET TO CHECK QUADRANT TO DETERMINE SIGN !!

20) $\sin -\frac{7\pi}{4}$

$\frac{\sqrt{2}}{2}$

$B = \frac{\pi}{4}$

ALL REF X'S IN Q1 have SIN, COS + TAN are POSITIVE

21) $\cos \frac{14\pi}{3} = 4\frac{2}{3}\pi$

$\frac{1}{2}$

$B = \frac{\pi}{3}$

22) $\sin \frac{17\pi}{3} = 5\frac{2}{3}\pi$

$-\frac{\sqrt{3}}{2}$

$B = \frac{\pi}{3}$

23) $\sin \frac{11\pi}{2} = 5\frac{1}{2}\pi$

-1

$(0, -1)$
 $B = \text{Quadrant}$

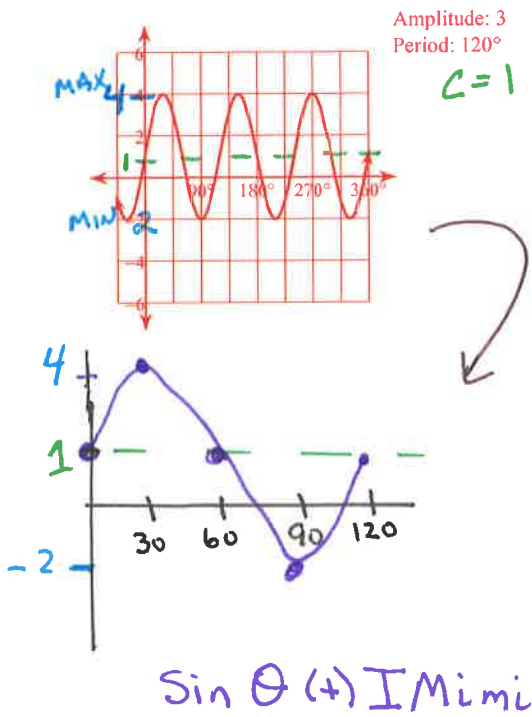
24) $\cos -4\pi$

1

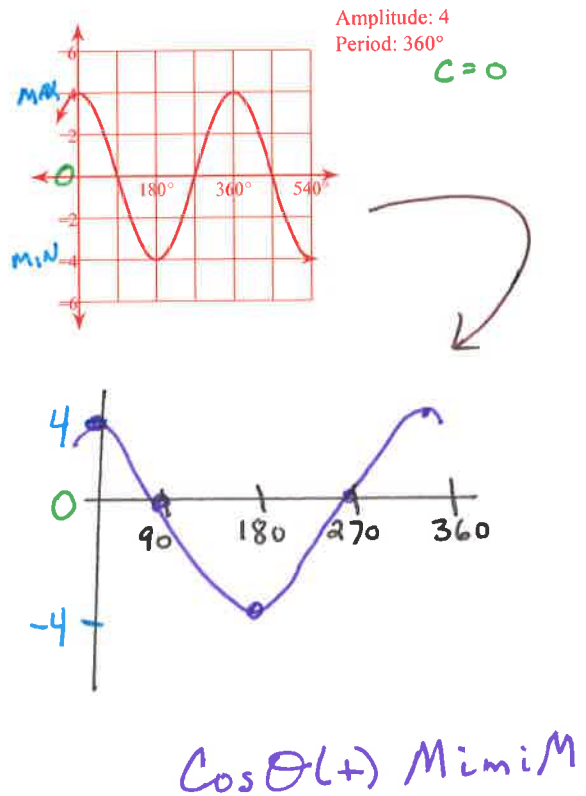
cosine
 $(1, 0)$

Use degrees. Find the AMPLITUDE(amp), PERIOD(per) & VERTICAL SHIFT(c).
 SKETCH the graph - include the 4 critical points, midline(if applicable), label scales and axes.

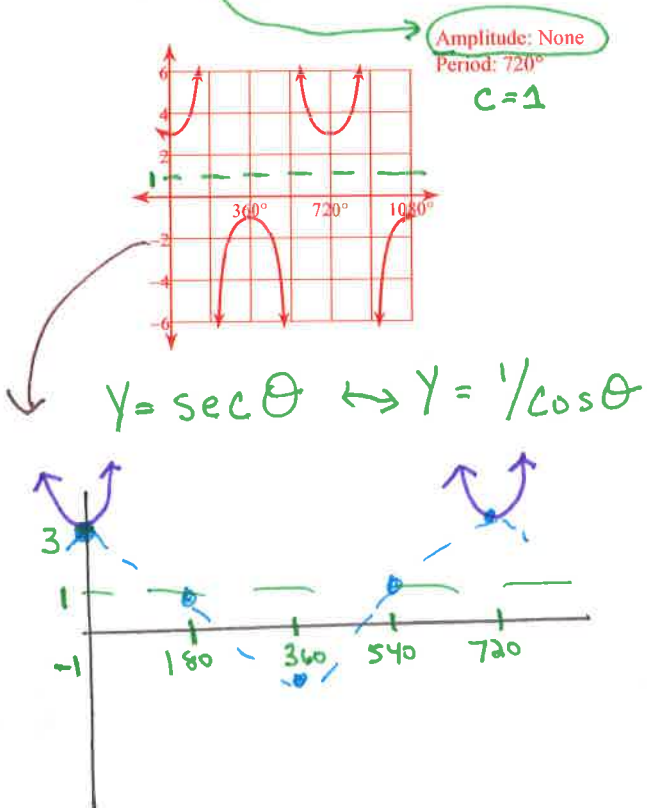
25) $y = 3\sin 3\theta + 1$



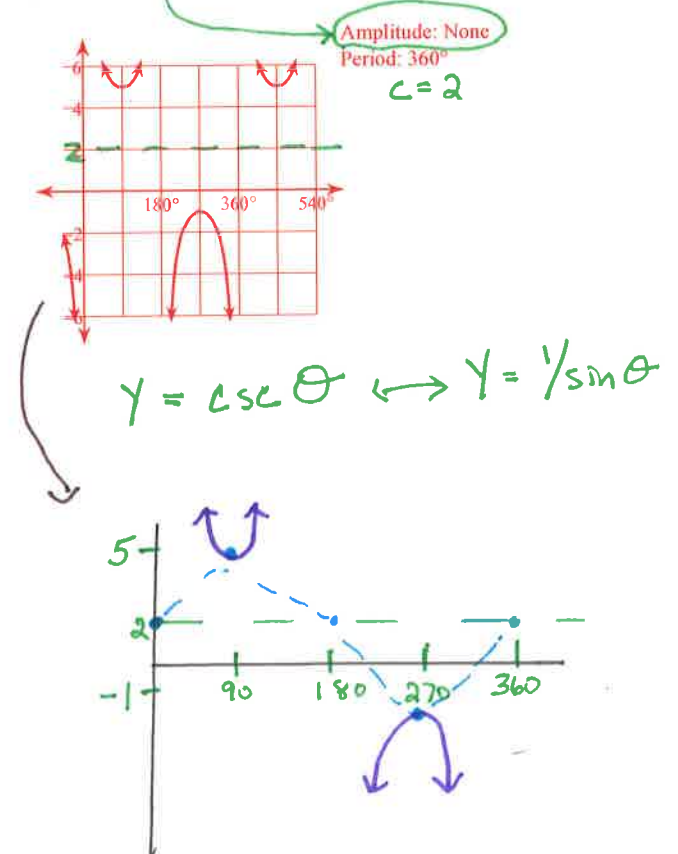
26) $y = 4\cos \theta$



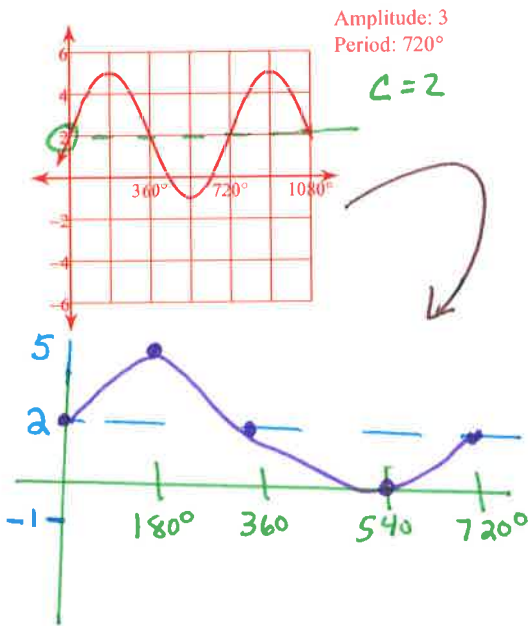
27) $y = 2\sec \frac{\theta}{2} + 1$



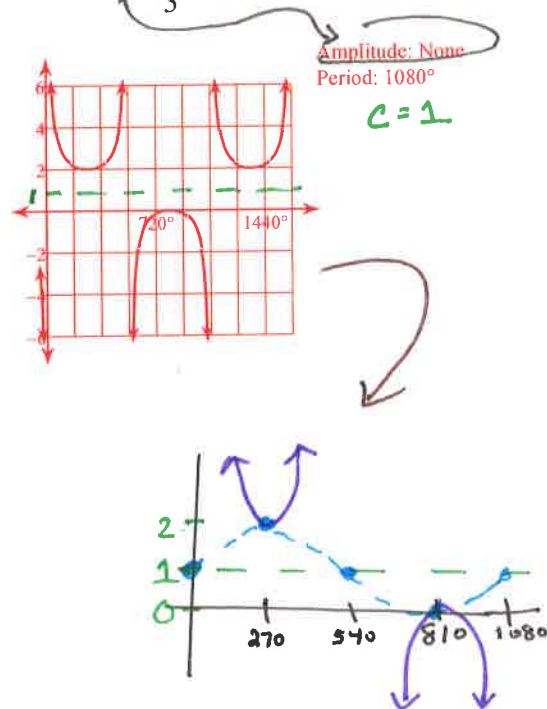
28) $y = 2 + 3\csc \theta$



29) $y = 3\sin \frac{\theta}{2} + 2$



30) $y = 1 + \csc \frac{\theta}{3}$



USING TECHNOLOGY TO SKETCH the graph to fit the scale of the given graph

*TIP: (Y=) > (ZOOM)ZTRIG > (WINDOW) set window to fit the scale of the given graph

Label midline(if applicable) with a dotted line, label x-axis minimum and maximum amplitudes and y-axes for periods.

CALC!

31) $y = \sin \frac{\theta}{4} - 2$

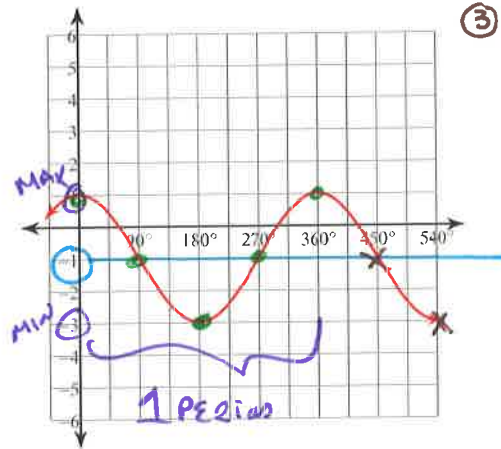


Amp = 1

Period = 360(4) = 1440°

C = -2

32) $y = 2\cos \theta - 1$



Amp = 2

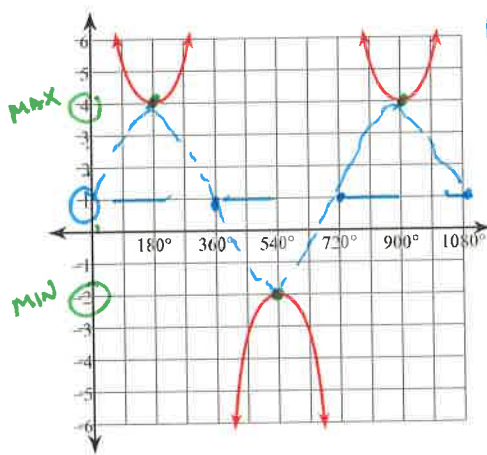
Period = 360°

C = -1

- ① Y=
- ② ZOOM ZTRIG
- ③ WINDOW
X: 0, 540, 90
Y: -6, 6, 1
- ④ TRACE
To locate points

33) $y = 3\csc \frac{\theta}{2} + 1$

$\leftarrow a$
 $\leftarrow B = \frac{1}{2}$
 $\leftarrow C = \text{vertical shift}$
 $\text{AMP} = a = 3$



Period = $\frac{360}{B}$
 $= 360 \div \frac{1}{2}$
 $= 360(2)$
 $= 720^\circ$

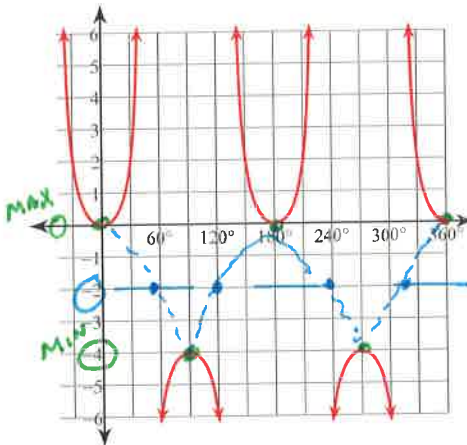
$Y = \csc \theta \leftrightarrow Y = \frac{1}{\sin \theta}$
 $y = 1 + 3\left(\frac{1}{\sin(x/2)}\right)$

WINDOW X: 0, 360, 720/4 = 180
 Y: -6, 6, 0

34) $y = 2\sec 2\theta - 2$

$\leftarrow C = -2$

AMP = 2
 Per = $\frac{360}{2} = 180^\circ$



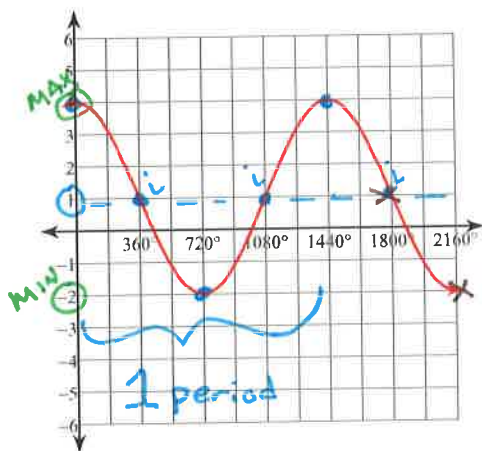
$Y = \sec \theta \leftrightarrow Y = \frac{1}{\cos \theta}$

$y = -2 + 2\left(\frac{1}{\cos(ax)}\right)$

WINDOW X: 0, 360, 180/4 = 45
 Y: -6, 6, 1

35) $y = 3\cos \frac{\theta}{4} + 1$

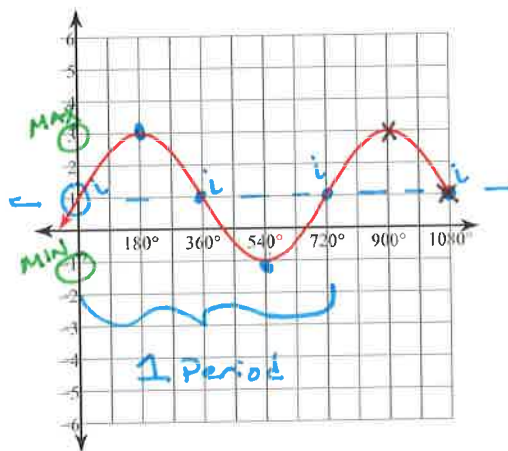
$\leftarrow B = \frac{1}{4}$
 $\leftarrow C = 1$
 AMP = 3



Per = $360(4) = 1440^\circ$

36) $y = 2\sin \frac{\theta}{2} + 1$

$\leftarrow C = 1$
 AMP = 2



Period = $360(2) = 720^\circ$