

PMATH 12 - CHAPTER 6 - PRETEST

signature _____

Multiple Choice - NON-CALCULATOR - 15 MINUTES (#1-6)

CIRCLE the choice that best completes the statement or answers the question.

1. What is the measure of the reference angle for an angle of -546° in standard position?

- A. 6° B. 6° ^{acute} C. 186° D. 84°

$$\begin{array}{r} -546 \\ +360 \\ \hline -186 \\ +180 \\ \hline -6 \end{array}$$

2. What is the length of the arc that subtends a central angle of 80° in the unit circle?

- A. $\frac{2}{9}\pi$ units B. $\frac{9}{4}\pi$ units C. 40π units D. $\frac{4}{9}\pi$ units

$$\frac{80}{180} = \frac{4}{9}$$

3. What is -120° in radians?

- A. $-\frac{2}{3}\pi$ radians B. $-\frac{21600}{\pi}$ radians C. -120π radians D. $-\frac{2}{3}$ radians

$$\frac{-120}{180} = -\frac{2}{3}$$

4. What is $\frac{3}{4}\pi$ radians in degrees? Give the answer to the nearest degree.

- A. 424° B. 135° C. 43° D. 2°

$$\frac{3}{4} \times 180$$

5. What is the amplitude of the function $y = 7\sin x$?

- A. -7 B. 7 C. 14 D. 7π

6. What is the period of the function $y = 7\cos\left(9\left(x + \frac{\pi}{7}\right) + 2\right)$?

- A. $\frac{2\pi}{9}$ B. $\frac{\pi}{7}$ C. 7π D. $\frac{9\pi}{2}$

$$\frac{2\pi}{9}$$

MULTIPLE CHOICE - CALCULATOR may be used after 15 minutes

7. What is the value of $\sin(-256^\circ)$ to the nearest thousandth?

- A. 0.970 B. -0.242 C. -0.970 D. 1.031

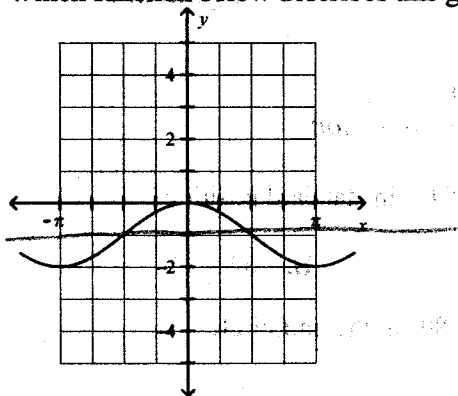
8. Graph $y = \sin x$ using graphing technology.

Which of these values is NOT an x-intercept of $y = \sin x$?

- A. -5π B. 3π C. $\frac{5\pi}{6}$ D. 8π

integer $\times \pi$

9. Which function below describes this graph?



- A. $y = \cos x$ B. $y = \cos x$ C. $y = \cos x - 1$ D. $y = \cos x - 1$

10. Identify the transformations that would be applied to the graph of $y = \cos x$ to get the graph of

$y = 7 \cos\left(x - \frac{\pi}{2}\right)$
 ↓ right

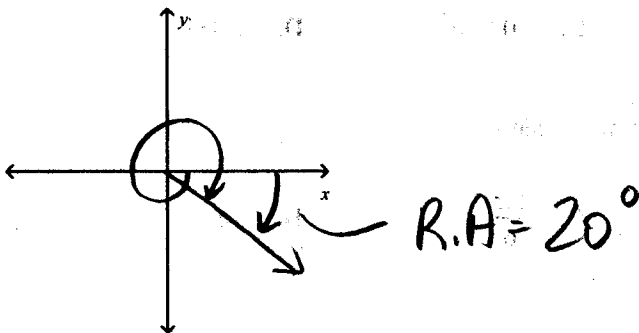
- A. A vertical stretch by a factor of 7, and then a translation of $\frac{\pi}{2}$ units left
 B. A vertical stretch by a factor of $\frac{\pi}{2}$, and then a translation of 7 units right
 C. A vertical stretch by a factor of 7, and then a translation of $\frac{\pi}{2}$ units right
 D. A horizontal stretch by a factor of 7, and then a translation of $\frac{\pi}{2}$ units right

11. What is the period of the function $y = 5 \sin \frac{3\pi}{5}(x+1) + 8$? $\rightarrow \frac{2\pi}{\frac{3\pi}{5}} = 2\pi \times \frac{5}{3\pi} = \frac{10}{3}$

- A. $\frac{13}{3}$ B. $\frac{3}{10}$ C. $\frac{10}{3}$ D. 2

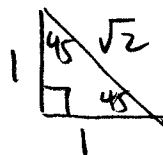
Short Answer - Show your work

1. Sketch the angle -380° in standard position, then identify the reference angle.



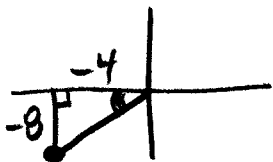
2. Determine the exact value of $\sin 135^\circ$.

$$180 - 135 = 45$$



$$\sin 135 = \sin 45 = \boxed{\frac{1}{\sqrt{2}}}$$

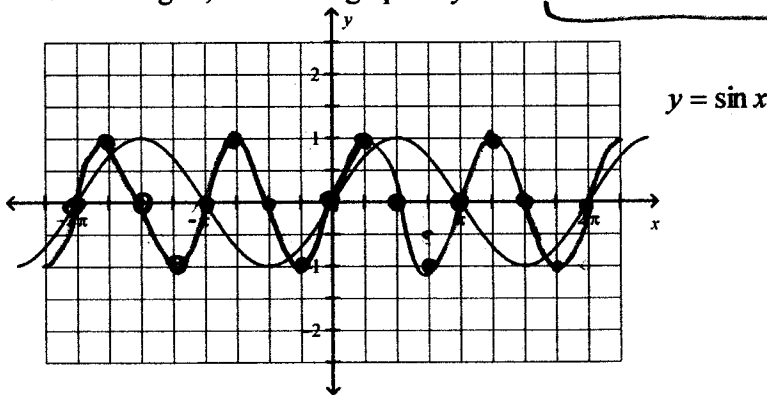
3. For the point $P(-4, -8)$ on the terminal arm of an angle θ in standard position, determine the exact value of $\cot \theta$.



$$\tan \theta = \frac{-8}{-4} = 2 \Rightarrow \cot \theta = \frac{1}{2}$$

4. The graph of $y = \sin x$ is shown below.

On the same grid, sketch the graph of $y = \sin 2x$.



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

5. Write an equation for a sine function with amplitude 2, period $\frac{\pi}{3}$, equation of centre line $y = 5$, and phase

$$\text{shift } -\frac{\pi}{8}$$

$$= c$$

$$a = 2$$

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

$$3(2\pi) = b\pi$$

$$6 = b$$

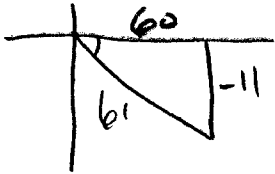
$$\uparrow 5 = d$$

$$y = 2 \sin 6\left(x + \frac{\pi}{8}\right) + 5$$

Problem - Show your work

1. $P(60, -11)$ is a terminal point of angle θ in standard position.

Determine the exact values of the six trigonometric ratios for θ .



$$\sin \theta = \frac{-11}{61}$$

$$\csc \theta = \frac{61}{-11}$$

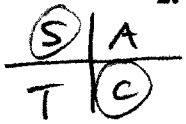
$$\cos \theta = \frac{60}{61}$$

$$\sec \theta = \frac{61}{60}$$

$$\tan \theta = \frac{-11}{60}$$

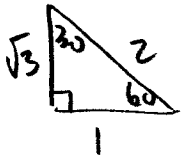
$$\cot \theta = \frac{60}{-11}$$

2. Given $\cot \theta = -\sqrt{3}$, determine all possible measures of angle θ in the domain $-2\pi \leq \theta \leq 2\pi$.



$$\downarrow \tan \theta = -\frac{1}{\sqrt{3}}$$

$$R.A. = 30^\circ = \frac{\pi}{6}$$



$$Q2 = 180 - R.A. = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$$

+2π Too Much
-2π = $-\frac{7\pi}{6}$

$$Q4 = 360 - R.A. = 2\pi - \frac{\pi}{6} = \frac{11\pi}{6}$$

+2π Too Much
-2π = $-\frac{\pi}{6}$

3. Graph $y = \sin(4x)$.

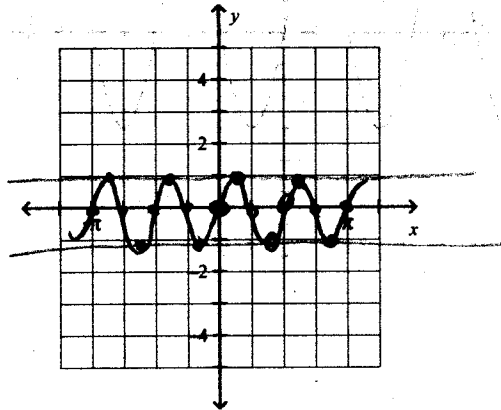
Identify the:

amplitude 1

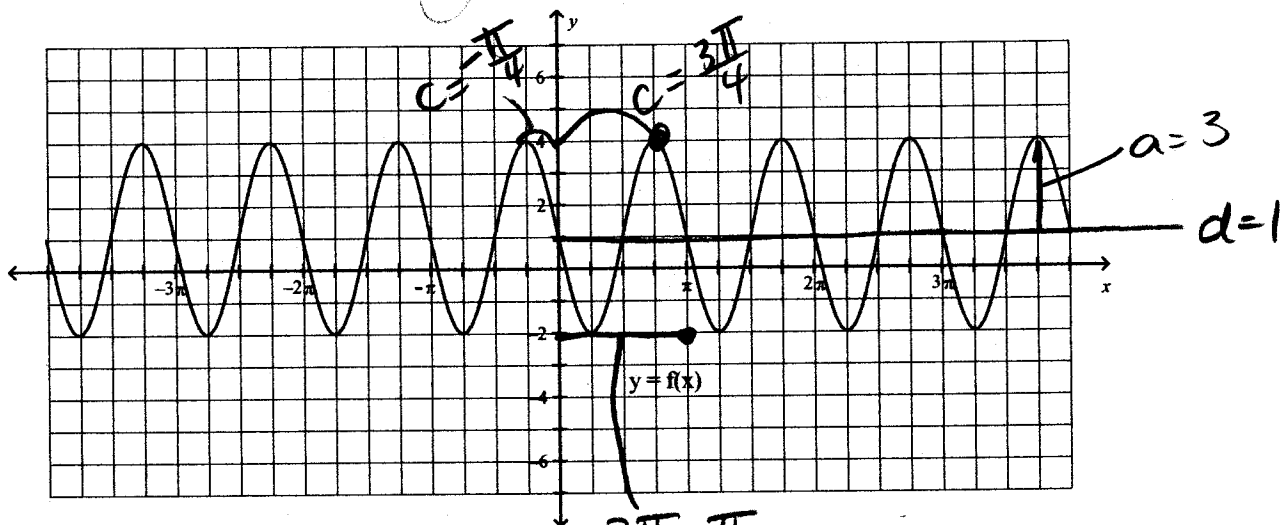
period $\frac{2\pi}{4} = \frac{\pi}{2}$

domain $x \in \mathbb{R}$

range $-1 \leq y \leq 1$



4. Write an equation in the form $y = a \cos b(x - c) + d$ for the graph below.



$$\frac{2\pi}{b} = \pi$$

$$b = 2$$

$$\frac{2\pi}{\pi} = b$$

$$2 = b$$

$$y = 3 \cos 2 \left(x + \frac{\pi}{4} \right) + 1$$

OR

$$y = 3 \cos 2 \left(x - \frac{3\pi}{4} \right) + 1$$