

EXAM 2

PART I: No calculators allowed. Solve each problem in the space provided. You must show **any and all work** for credit. Leave answers in exact, simplified form. Circle your final answer for each problem.

1. Convert 260° to radians. Leave your answer in terms of π . 2. Convert $-\frac{5\pi}{18}$ to degrees.

3. Find each value using a reference angle. Leave answers in exact form.

(a) $\sin\left(\frac{5\pi}{4}\right)$

(b) $\sec(-210^\circ)$

4. For $y = 2 + 3\cos(6x + \pi)$, state the amplitude, period and phase shift.

Amplitude = _____ Period = _____ Phase shift = _____

5. State the range for each inverse function.

(a) $y = \sin^{-1}x$

R =

(b) $y = \cos^{-1}x$

R =

(c) $y = \tan^{-1}x$

R =

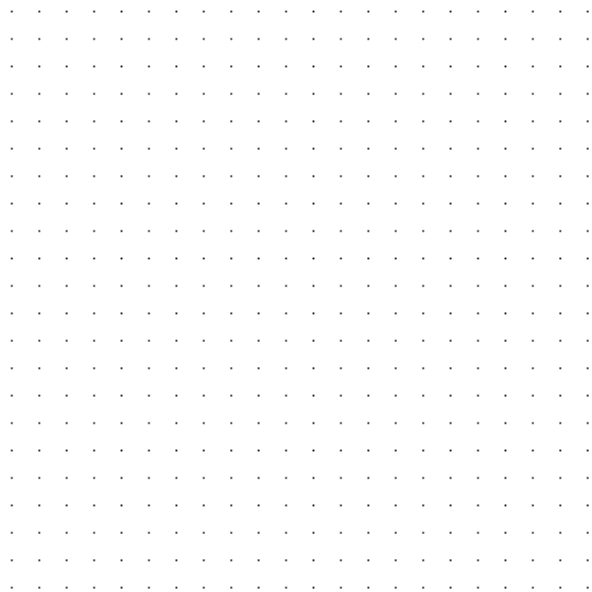
6. Find **exact** values in radians.

(a) $\arcsin\left(-\frac{1}{\sqrt{2}}\right)$

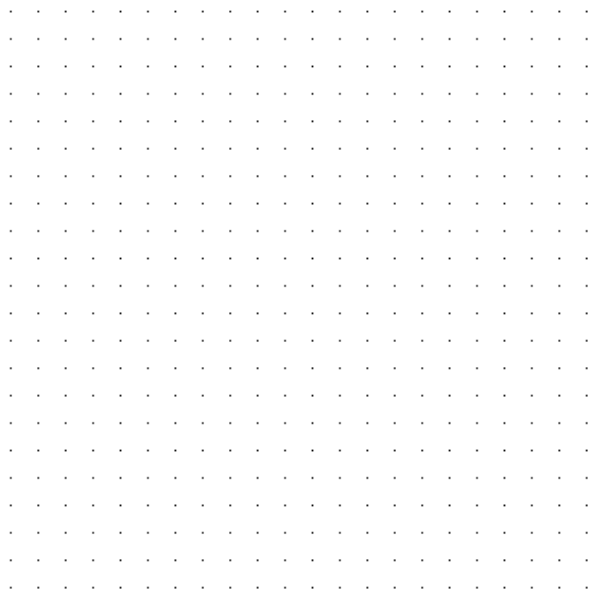
(b) $\cos^{-1}\left(-\frac{1}{2}\right)$

For questions 7-8, graph each function **carefully** on the grid provided. Show at least one complete cycle and label the coordinates of the endpoints of the cycle. You must draw your own axes and label them so that the scale is clear.

7. $y = -3 \tan\left(\frac{1}{2}x\right)$



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



9. Simplify and write your answer in *exact* form.

(a) $\sin^{-1}\left(\sin\frac{\pi}{12}\right)$

(b) $\tan\left(\cos^{-1}\frac{1}{\sqrt{10}}\right)$

10. Write $\sin(\tan^{-1} x)$ as an algebraic expression that does not involve any trigonometric functions. Assume x is positive.

PART II: Calculators are permitted. Solve each problem in the space provided. You must show *any* and *all* work for credit. Approximate answers as indicated. Circle your final answer for each problem.

11. State the reference angle for each of the following:

(a) -155°

(b) $\frac{5\pi}{3}$

12. Use your calculator to find the angle θ ($0^\circ \leq \theta \leq 360^\circ$) to the nearest tenth of a degree. Show enough work so that I understand how you arrived at your answer.

(a) $\cos \theta = 0.3456$, θ in QIV

(b) $\tan \theta = -5.6713$, θ in QII

13. A lawn sprinkler has been set to rotate through an angle of 100° and project water out 22 feet. What is the area of the yard watered by the sprinkler (a sector of a circle)?

14. A pulley driven by a belt is making 10 revolutions per second. If the pulley is 6 inches in diameter, find the linear velocity of the belt, in feet per second.

15. Find a trigonometric model (equation) to match the graph shown.

