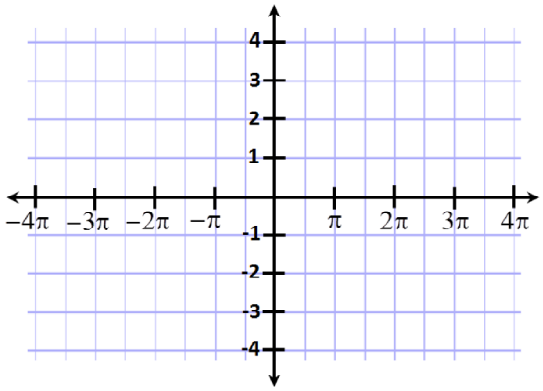
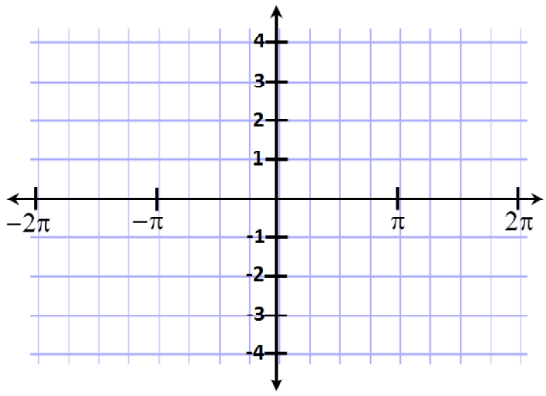
Name: _____ Per. ____

Pre-Calculus Test Chapter 4 Part 2 Form A Show ALL work!!!

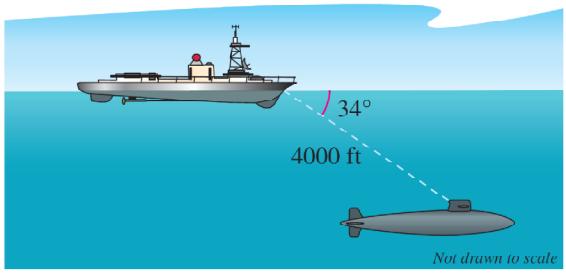
1 Graph $y = 3\sin x$ along the whole grid.



2 Graph $y = \tan\frac{x}{2}$ along the whole grid.

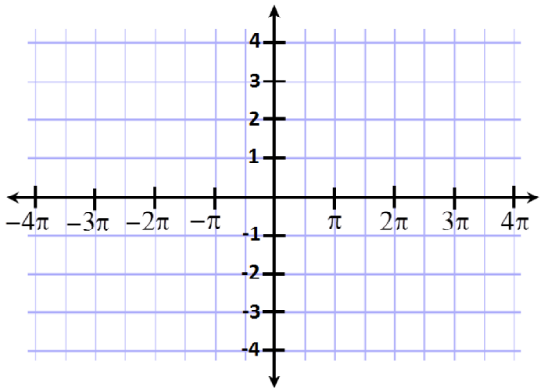


3 **Sonar** The sonar of a navy cruiser detects a submarine that is 4000 feet from the cruiser. The angle between the water line and submarine is 34°. How deep is the submarine.

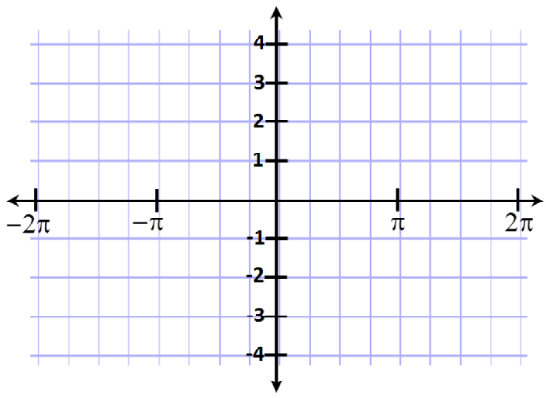


4 **Oscillation of a Spring** Write the equation for the simple harmonic motion of a ball on a spring that starts at its lowest point of 6 inches below equilibrium, bounces to its maximum height of 6 inches above equilibrium, and returns to its lowest point in a total of 2 seconds.

5 Graph $y = \cos\left(x - \frac{\pi}{2}\right)$ along the whole grid.



6 Graph $y = 2\csc x + 1$ along the whole grid.



7 **Shadows** The sun is 20° above the horizon. Find the length of a shadow cast by a building that is 600 feet tall.

8 **Geometry** Find the length of a side of a regular octagon inscribed in a circle of radius 25 inches.

9 **Navigation** A ship leaves port at noon and has a bearing of S 29° W. The ship sails at 20 nautical miles per hour. At 6:00 P.M., the ship changes course to due west. What is the ship's bearing and distance from the port of departure at 7:00 P.M.?

Bearing:

Distance:

10 **Location of a Fire** Two fire towers are 30 kilometers apart, where tower A is due west of tower B. A fire is spotted from the towers, and the bearings from A and B are N 76° E and N 56° W, respectively. Find the distance d of the fire from the line segment AB.