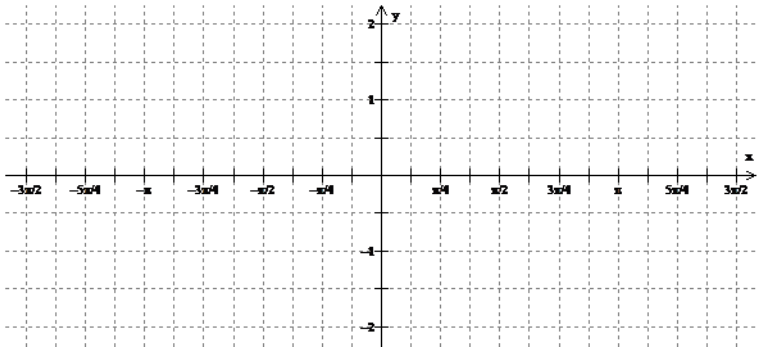
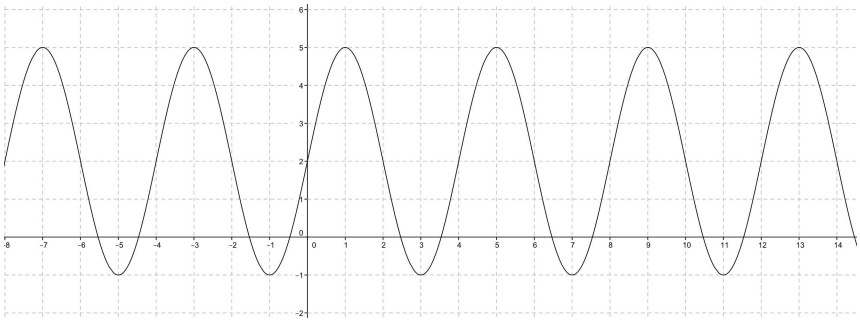
Math 261 - Lab 3 **Trigonometry Review** **Name:** _____

1. Plot the graph of $f(x) = 2\sin x$ on the following coordinate plane.



2. Find a trigonometric function that has the following graph.



3. Find the exact value for each of the following.

(a) $\cot\left(\frac{4\pi}{3}\right)$ (b) $\sin\left(\frac{21\pi}{4}\right)$ (c) $\sec(270°)$

(d) $\tan\left(\frac{\pi}{3}\right)$ (e) $\cos\left(\frac{5\pi}{3}\right)$ (f) $\csc\left(\frac{11\pi}{6}\right)$

(g) $\sin(315°)$ (h) $\cos(150°)$ (i) $\arctan(1)$

(j) $\arcsin(1)$ (k) $\tan^{-1}\left(-\frac{1}{\sqrt{3}}\right)$ (l) $\sin^{-1}\left(-\frac{1}{\sqrt{2}}\right)$

(m) $\tan^{-1}(0)$ (n) $\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$ (o) $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

4. To find the distance to a point on the opposite side of a lake, a surveyor measured the angles from two points that were 87 meters apart. The respective measured angles were 89° and 87° where each angle was measured with respect to the other point. Approximate the distance from each point to the point on the opposite side of the lake to within one meter.

5. Simplify each expression as much as possible.

   (a) $\tan^2(3\beta) - \dfrac{1}{\cos^2(3\beta)}$

   (b) $\sqrt{1-\cos^2(\theta)}$ for θ in the third quadrant.

6. Solve each of the following on the interval $[-\pi, \pi]$. Give **exact** values.

   (a) $\tan(3x) = \sqrt{3}$

   (b) $\sin(5x)\cos(3x) \geq \cos(5x)\sin(3x)$

7. Find *all* solutions to the following equations. Give **exact** answers.

   (a) $\sec\left(4x - \dfrac{\pi}{6}\right) = 2$

   (b) $3\cos^2(x) = \cos(x) + 4$