MAT 108 Sample Final Exam

General Instructions: Answer each question in the book provided. Partial credit will be given. so show all of your work. You may use a scientific calculator on this exam, but must show work to receive full credit where indicated.

Scoring. Problems 1 is worth 10 credits. Problem 2 is worth 8 credits. Every other question is worth 6 credits each.

1. Compute the exact value for each. If a value is undefined, then write undefined. Show work to justify your answers.

   (a) $\cos(0)$

   (b) $\sin(-\pi)$

   (c) $\sec(\pi/2)$

   (d) $\tan(\pi)$

   (e) $\csc(7\pi)$

2. Compute the exact value for each. If a value is undefined, then write undefined. Show work to justify your answers.

   (a) $\sin(60°)$

   (b) $\sec(30°)$

   (c) $\cos(225°)$

   (d) $\tan(-120°)$

3. Compute the exact value for each. If a value is undefined, then write undefined. Show work to justify your answers.

   (a) $\cos^{-1}(1)$

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

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

4. If $\tan(\theta) = -2/3$ and θ is in Quadrant II, find all six trigonometric values of θ.

5. Draw the graph of $y = 4\sin\left(\frac{x}{3}\right)$. Show at least two full cycles.

6. State the formula for $\cos(a + b)$ and use it to prove that $\cos(a + \pi) = -\cos(a)$.

7. Suppose $\triangle ABC$ has $B = 38°$, $C = 47°$, and $c = 5$ in. Solve for the remaining triangle measurements.

8. Use a right triangle to write the following as an algebraic expression

$$\sin(\cos^{-1}(5x))$$

   (Assume that x is positive and that the functions are defined for the given expressions.)

9. At a point 50 feet from the base of a building, the angle of elevation is $32.4°$. Approximate the height of the building to the nearest foot.