

The majority of the credit you receive will be based on the completeness and the clarity of your responses. Show your work, and avoid saying things that are untrue, ambiguous, or nonsensical. This test has 6 questions, for a total of 60 points.

(10 points) 1. A point on the rim of a circular waterwheel of radius 12 feet makes one complete revolution every 10 seconds. 1) Find the distance the point makes in one revolution. 2) Find the angular speed and 3) Find the linear speed of the circular motion of the moving point.

(10 points) 2. Find *all* solutions to the given equation: $\sin \theta = \frac{-1}{2}$

(10 points) 3. Is cotangent ($\cot \theta$) an even or an odd function? Prove it.

(10 points) 4. Assume that $\cos t = \frac{12}{13}$, $\sin t < 0$. Find the following:
1) $\cos(-t)$
2) $\sin(t)$
3) $\tan t$
4) $\sin(-t)$.

(10 points) 5. Identify the amplitude, vertical shift, phase shift, and period of the following function, and then sketch a graph of one cycle including AT LEAST 3 points on the function (EXACT ANSWERS).

$$y = 6 \cos(4x + 8) - 3$$

(10 points) 6. Assume that the terminal side of an angle of measure t radians in standard position lies in the 3rd quadrant on the line with equation $y = 3x$. Evaluate the six trigonometric functions at t .