

PRACTICE EXAM 3 - MATH 140

DATE: Friday, October 28

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. To approximate the speed of the current of a river, a circular paddle wheel of radius 4 feet is lowered into the water. If the current causes the wheel to rotate at a speed of 10 revolutions per minute, what is the speed of the current?
2. Suppose that the point $(-4, 2)$ is on the terminal side of the angle θ . Find the trigonometric numbers of θ .
3. Suppose that $\sin \theta = -\frac{5}{13}$ and that $\frac{3\pi}{2} < \theta < 2\pi$. Find each of the remaining trigonometric numbers of θ .
4. (a) Sketch carefully the graph of $f(x) = \cos x$ in $0 \leq x \leq 2\pi$.
(b) Use the graph of Part (a) and transformations to obtain a rough sketch of the graph of $g(x) = 2 \cos(x - \pi) - 2$.
(You do not get credit if you do not label all relevant points carefully!)
5. Sketch carefully the graph of $f(x) = \cot(-x)$ in the interval $-\pi \leq x \leq \pi$. (You do not get credit if you do not label all relevant points carefully!)
6. (a) Find the amplitude, period and phase shift of the function $f(x) = 2 \cos(2\pi x + 4)$.
(b) Write an equation of a sine function with amplitude $A > 0$, having amplitude 7, period 12π and phase shift $\frac{3}{2}$.