Review for Exam 2

MATH 1112 sections 54 Spring 2019

Sections Covered in Bittinger: 2.5, 2.4, 5.2, 5.3, 5.4, 5.5, Intro to Angles (In Miller: 2.6, 2.7, 4.2, 4.3, 4.4, 4.5, 5.1)

Calculator Policy: There will be NO calculator use on this exam. You are strongly encouraged to prepare for the exam without relying on a calculator.

This review is provided as a courtesy to give some idea of what material is covered. Nothing else is intended or implied.

(1) Use transformations to produce a rough plot of each of the following. Label key points (such as intercepts)

(a) $y = \sqrt{x-2}$

(b) $y = \sqrt{x} - 2$

(c) $y = (x+3)^3 + 1$

(d) $y = -\sqrt{x+2}$

(2) Consider the piecewise defined function $f(x) = \begin{cases} x+2, & x < -1 \\ -x, & -1 \leq x < 0 \\ 2x, & 0 \leq x \end{cases}$.

Plot $y = f(x)$. Then use your graph to plot each of the following involving transformations.

(a) $y = f(x-3)$

(b) $y = -f(x)$

(c) $y = f(x) + 2$

(d) $y = f(-x)$

(3) Complete these definitions.

(a) *A function $f(x)$ is an even function if…for each x in the domain of f.*

(b) *A function $f(x)$ is an odd function if…for each x in the domain of f.*

(4) Determine algebraically whether each function is even, odd, or neither.

(a) $f(x) = x + |x|$

(b) $g(x) = \sqrt{x^2 + 1}$

(c) $h(t) = \frac{t}{t^2+4}$

(d) $S(x) = \frac{2x-1}{(x-1)^2}$

(e) $M(x) = N(x) + N(-x)$ where N is any function whose domain is all real numbers.

(5) Identify each statement as true or false. (Full disclosure, some of these are meant to be silly.)

(a) $\dfrac{\ln(x)}{x} = \ln$

(b) $\log_4(x) = \dfrac{\log_5(x)}{\log_5(4)}$

(c) $(e^x)^2 = e^{2x}$

(d) $\ln x = \dfrac{1}{x}$

(e) $\log_a(x - y) = \dfrac{\log_a(x)}{\log_a(y)}$

(f) $\log(8^9) = 9\log(8)$

(g) $e^{9x} = 9e^x$

(6) Evaluate each expression without a calculator

(a) $\log_3(1)$ (b) $\log_2 \dfrac{1}{32}$ (c) $\ln \sqrt{e}$

(d) $\log(0.0001)$ (e) $\log_4(2^7)$ (f) $\log_\pi \pi$

(7) Express as a single logarithm. Simplify if possible.

(a) $4\ln x + \dfrac{1}{3}\ln y - 2\ln z$ (b) $\log_2(x^3 - 8) - \log_2(x^2 + 2x + 4)$

(8) Expand as a sum or difference of logarithms.

(a) $\ln \sqrt[4]{wr^2}$ (b) $\log \sqrt[3]{\dfrac{M^2}{N}}$

(9) Solve each equation. Obtain an exact solution.

(a) $\log_3(x) + \log_3(x + 1) = \log_3(2) + \log_3(x + 3)$

(b) $\log_3(x^2 + x) = \log_3(2) + \log_3(x + 3)$

(c) $e^x + e^{-x} = 3$

(d) $5^{x+1} = 3^{2x-1}$

(10) Convert each angle to radian measure.

(a) 60°

(b) -120°

(c) 18°

(d) -75°

(11) Convert each angle to degrees.

(a) $\dfrac{\pi}{12}$

(b) -2π

(c) $\dfrac{4\pi}{3}$

(d) 2

(12) Determine each of the following.

(a) The arclength of a circle of radius 5 subtended by a central angle of 120°.

(b) The area of a sector of a circle of radius 5 for which the central angle is 120°.

(c) The distance traveled by at point at the tip of a minute hand of a clock between 1:45 pm and 2:05 pm if the minute hand is 6 inches long.

(13) Determine if the given angles are complements, supplements, coterminal, or none of these three things.

(a) $\dfrac{\pi}{3}$ and $\dfrac{\pi}{6}$

(b) $\dfrac{4\pi}{3}$ and $-\dfrac{2\pi}{3}$

(c) 137° and 43°

(d) $\dfrac{\pi}{2}$ and -270°