MAT122 - Homework 2
Due February 1

Write answers on your own paper. Show your work, staple, and be neat. Sloppy work will not be graded. I recommend that you work answers on scrap paper before transcribing to the final copy.

1.   If you invest $500 in an account which earns 6% annual interest, approximately (to 2 decimal places) how much money do you have after 10 years if it is
      (a) Compounded annually?
      (b) Compounded weekly? (assume 52 weeks in a year)
      (c) Compounded daily? (assume no leap years)
      (d) Compounded continuously?

2.   On separate axes, graph the functions f, g, and h given by
      (a) $f(x) = 3\sin(x - \pi/2) + 1$
      (b) $g(x) = \sin(\pi x)$

      (c) $h(x) = \dfrac{2x^3 - 5x}{1 - x^3}$

3.   Solve for x: $5 \cdot 4^x = 3^{x+2}$

4.   Simplify

      (a) $\log_2 \dfrac{1}{32}$

      (b) $e^{2\ln(\pi)}$

      (c) $\arctan(\sqrt{3})$

      (d) $\arcsin(-\dfrac{\sqrt{2}}{2})$

5.   Why is $(x - 2)$ a factor of $x^7 - 3x^4 + 2x^3 - x^2 + x - 94$?

6.   Suppose f is given by $f(x) = \dfrac{sin(x)}{x^3 - x^5}$. Is f an odd function, an even function, or neither?
      Why?

7.   If $f(x) = \sqrt{x^2 - 1}$ and $g(x) = \dfrac{1}{x - 3}$, find

      (a) $f(g(x))$
      (b) $g(f(x))$

8.   If $f(x) = \dfrac{x + 2}{x - 1}$, then give an expression for $f^{-1}(x)$.