28 Aug Recitation Worksheet for MA141

1. Describe in words how each of the following functions differs from $f(x)$.

   (a) $f(x+2)$

   (b) $2 * f(x)$

   (c) $-f(x)$

   Graph the above functions for $f(x) = x$ and for $f(x) = x^2$.

2. Recall that $(f \circ g)(x)$, read as f of g of x, is $f(g(x))$. If $f(x) = x^2$, $g(x) = 3x+2$, and $h(x) = (x-2)^2 - 5$. Find:

   (a) $(f \circ g)(x)$

   (b) $(h \circ g)(x)$

   (c) $(g \circ f)(x)$

   Evaluate each of the above for $x = -1, 0$, and 1.

3. For the following functions, state if it is monotonically increasing, monotonically decreasing or neither. If neither, provide an example showing it is not monotonically increasing and an example that it is not monotonically decreasing.

   (a) $f(x) = x^2$

   (b) $f(x) = x^3$

   (c) $f(x) = -5x + 2$

4. For the following functions f, determine if it has an inverse function f^{-1} and find it, or explain why it does not have one.

   (a) $f(x) = (x-2)^3$

   (b) $f(x) = \ln(x+2)$

   (c) $f(x) = 4e^{2x+1}$

   (d) $f(x) = 5x^2 + 4$

5. Graph the following parametric curves and eliminate the parameter t to have a Cartesian equation of the curve.

   (a) $x = 2t$ and $y = 4t^2$

   (b) $x = t + 1$ and $y = \frac{1}{t+1}$

   (c) $x = 2^t$ and $y = t^2$