**Math 131 - February 10, 2015**

# Warm-up Problems

1. For each of the following functions and $x$-values, find the slope of the tangent line at the given value.

   (a) $f(x) = 7x + 12$ at $x = -4$.

   (b) $f(x) = 7x^2 + 12$ at $x = -4$.

   (c) $f(x) = 2x^2 + x - 1$ at $x = -1$.

   (d) $f(x) = \frac{1}{x}$ at $x = 2$.

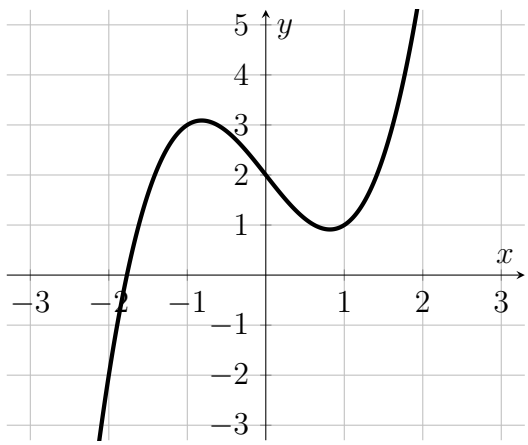
   (e) $f(x) = \sin x$ at $x = 0$.

   (f) $f(x) = \sqrt{1 - x^2}$ at $x = 0$.

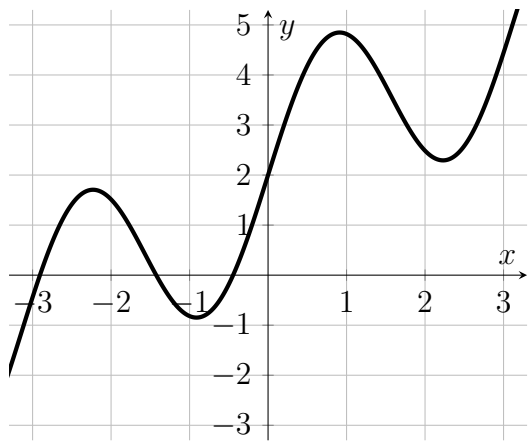
# Lecture Problems

2. Given the graph of the function, $f(x)$, draw a possible graph for $f'(x)$.

(a)




(b)




3. Given $f(x)$, find $f'(x)$ using the limit definition of $f'$.

   (a) $f(x) = 7x + 12$. $f'(x) =$.

   (b) $f(x) = 7x^2 + 12$. $f'(x) = 14x$.

   (c) $f(x) = 2x^2 + x - 1$. $f'(x) = 4x + 1$.

   (d) $f(x) = \frac{1}{x}$. $f'(x) = -1/x^2$.

   (e) $f(x) = \sin x$. $f'(x) = \cos x$.

   (f) $f(x) = \sqrt{1 - x^2}$. $f'(x) =$.