

**Math 131 - February 10, 2015**  
**Solutions**

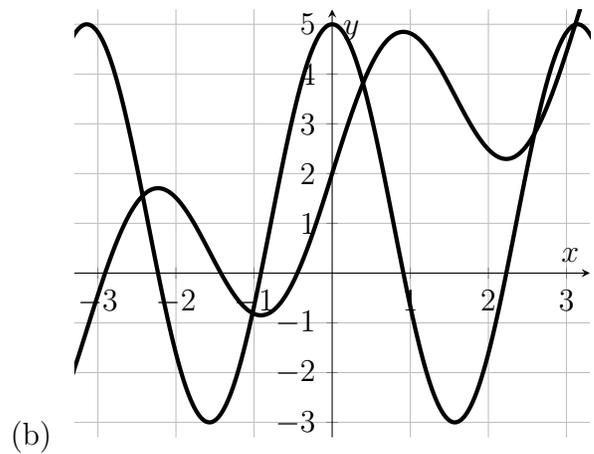
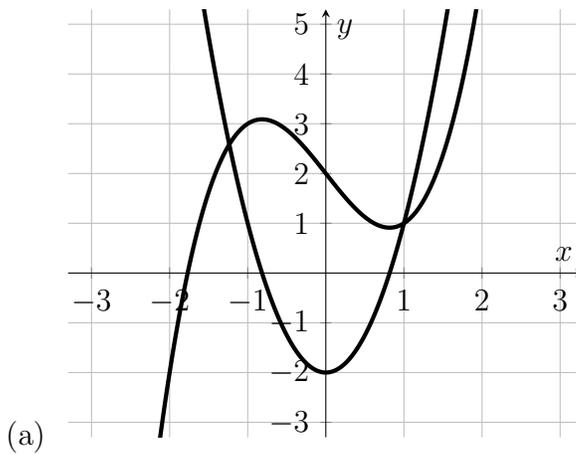
## Warm-up Problems

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 $x = -4$ . $m = 7$	(d) $f(x) = \frac{1}{x}$ at $x = 2$ . $m = -\frac{1}{4}$
(b) $f(x) = 7x^2 + 12$ at $x = -4$ . $m = 98$	(e) $f(x) = \sin x$ at $x = 0$ . $m = 1$
(c) $f(x) = 2x^2 + x - 1$ at $x = -1$ . $m = -3$	(f) $f(x) = \sqrt{1 - x^2}$ at $x = 0$ . $m = 0$

## Lecture Problems

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



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

(a) $f(x) = 7x + 12$ . $f'(x) = 7$ .	(d) $f(x) = \frac{1}{x}$ . $f'(x) = -1/x^2$ .
(b) $f(x) = 7x^2 + 12$ . $f'(x) = 14x$ .	(e) $f(x) = \sin x$ . $f'(x) = \cos x$ .
(c) $f(x) = 2x^2 + x - 1$ . $f'(x) = 4x + 1$ .	(f) $f(x) = \sqrt{1 - x^2}$ . $f'(x) = \text{Ugh!}$ .