

**Calculus I**  
**Practice Problems 1**

Note: First read the relevant section, and then begin to do these problems. Do not refer to the answers until you have worked on the problem.

After doing these practice problems, go to the Webwork Assignment for the week.

1. Find the equation of the line which goes through the point (2,-1) and is parallel to the line given by the equation  $2x - y = 1$ .

2. Find the equation of the line which goes through the point (2,-1) and is perpendicular to the line given by the equation  $2x - y = 1$ .

3. Find the equation of the line which goes through the point (1,2) and is parallel to the line through the points (0,1) and (-2,7).

4. Find the derivative:  $f(x) = x^3 - x^2 + 1$

5. Find the derivative:  $f(x) = x^5 + 3x^4 - 2x^2 + 4x - 7$

6. Find the derivative:  $f(x) = x^4 - 2x^3 + 5x^2 - x + 7$

7. Find the derivative:  $f(x) = 3x^{-1} + x^3$

8. Find the equation of the tangent line to the graph of  $y = x^3 - 3x^2 + x$  at the point (2,-2).

9. Let  $y = 16x^{-1} - x^2$ . At what point(s) is the tangent line horizontal?

10. Let  $y = 4x^4 + x$ . At what point is the tangent line to the graph perpendicular to the line tangent to the graph at (0,0)?

11. Find the derivative:  $f(x) = \left(x^2 + \frac{1}{x^3}\right)(x^3 - x^2 + 1)$

12. Find  $f'$  and  $f''$ :  $f(x) = \left(x + \frac{1}{x}\right)(x^2 + 1)$