Practice Exercise
Week #2 (part 1)

The even-numbered problems are selected from the required textbook. The answers to these problems are given in a separate file. The link to the answers to next to the link to this file.

Section 1.5.

Find the dy/dx of the following functions

14. $y = 3x^{10}$

18. $y = 3x^{-5}$

26. $y = -4.8x^{1/3}$

Find the derivative of the following functions (Hint: simplifying before taking derivative if n**)**

30. $\frac{d}{dx}\left(\sqrt[3]{x} + \frac{4}{\sqrt{x}}\right)$

38. $f(x) = \frac{5}{x} - x^{2/3}$

48. $y = \frac{2}{x} - \frac{x}{2}$

56. If $y = \frac{1}{3x^4}$, find $\frac{dy}{dx}$ at $x = -1$.

For each function, find the points on the graph at which the tangent line is horizontal. If none exist, state that fact.

64. $y = -x^3 + 1$

66. $y = 3x^2 - 5x + 4$

78. $f(x) = \frac{1}{3}x^3 + \frac{1}{2}x^2 - 2$

For each function, find the points on the graph at which the tangent line has slope 1

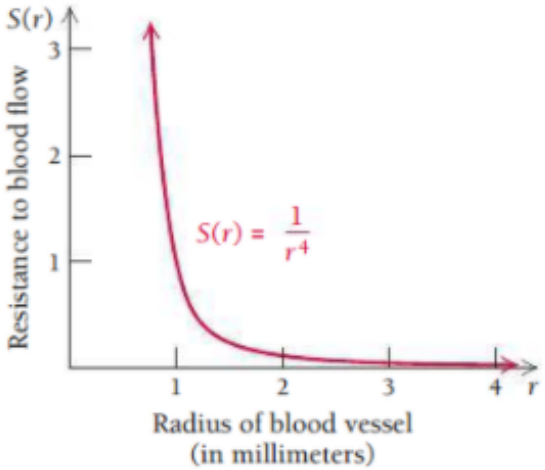
80. $y = 20x - x^2$

86. $y = \sqrt{x} + \frac{1}{2}x$

90. Blood flow resistance. The equation

$$S(r) = \frac{1}{r^4}$$

can be used to determine the resistance to blood flow, S, of a blood vessel that has radius r, in millimeters (mm). (*Source*: *Mathematics Teacher*, Vol. 99, No. 4, November 2005.)



a) Find the rate of change of resistance with respect to r, the radius of the blood vessel.
b) Find the resistance at $r = 1.2$ mm.
c) Find the rate of change of S with respect to r when $r = 0.8$ mm.