MATH 103 200710 Problem Set 1

Edward Doolittle

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The following problems from chapters 1.1 and 1.2 may appear on the quiz on Thursday, February 1.

1. Find the slopes and y-intercepts of the following lines:

   (a) $y = 4 + 3x$ (b) $y = 5$ (c) $5x + 2y = -1$

2. Find an equation for each of the following lines.

   (a) Slope is 5; $(1,2)$ is on the line.
   (b) $(\frac{1}{2},1)$ and $(2,5)$ on the line.
   (c) Parallel to $y - x = 4$; passes through $(3,-5)$.
   (d) x-intercept is 2, y-intercept is -6.

3. A company manufactures and sells widgets. The company has a fixed cost of \$2500 per day and a total cost of \$3600 per day when the production is set at 110 rods per day. Assume that the total cost $C(x)$ is related to the daily production level x.

   (a) Express the total daily cost as a function of the daily production level.
   (b) What is the marginal cost at production level $x = 150$?
   (c) What is the additional cost of raising the daily production level from 150 to 151 rods? Answer the question in two different ways: by using the marginal cost, and by calculating $C(151) - C(150)$.

4. Find the slope of the tangent line to the graph of $y = x^2$ at the point indicated, and then find an equation of the corresponding tangent line.

   (a) $(2,4)$ (b) $(0,0)$ (c) $(-2/5,4/25)$

5. Write the equation of the tangent line to the graph of $y = x^2$ at the point where $x = -0.8$.

6. Find the point on the graph of $y = x^2$ where the curve has slope -6.

7. Find the point on the graph of $y = x^2$ where the tangent line is parallel to the line $x + 9y = 7$.

8. Find the slope of the curve $y = x^3$ at the indicated points.

   (a) $(3,27)$ (b) $(-1,-1)$ (c) $(1/2,1/8)$

9. Write an equation of the line tangent to the graph of $y = x^3$ at the point where $x = -2$.

10. Find an equation of the tangent to the graph of $y = x^3$ which is parallel to the line $y - 12x = 7$.

Please do the following problems from the textbook. They may appear on Midterm Test 1.

1.1 C-level: 1–24, 31, 43–44; B-level: 32–42, 47–60; A-level: 25–30, 45–46;

1.2 C-level: 1–14, 19–24, 29–32; B-level: 15–18, 25–28;