

**Quiz 2 Solutions, Math 220, Professor David Levermore**  
**Friday, 10 September 2010**

- (1) [2] Give the equation of the line with slope  $-1$  that passes through the point  $(2, -3)$ .

**Solution.** The point-slope form for the equation of the line through the point  $(a, b)$  with slope  $m$  is  $y = b + m(x - a)$ . For the point  $(a, b) = (2, -3)$  and the slope  $m = -1$  this form yields the equation

$$y = -3 - 1(x - 2) = -3 - x + 2 = -1 - x.$$

- (2) [4] Find the slope of the line that passes through the points on the curve  $y = x^2$  with  $x = 1$  and  $x = 1.2$ .

**Solution.** The points on the curve  $y = x^2$  with  $x = 1$  and  $x = 1.2$  are

$$(x, y) = (1, 1^2) = (1, 1) \quad \text{and} \quad (x, y) = (1.2, 1.2^2) = (1.2, 1.44).$$

The slope of the line that passes through these points is

$$m = \frac{1.44 - 1}{1.2 - 1} = \frac{.44}{.2} = 2.2.$$

- (3) [4] Give the equation of the tangent line to the curve  $y = x^2$  at the point where  $x = 2$ . (You may use the fact that the slope of  $y = x^2$  at  $(x, y)$  is  $2x$ .)

**Solution.** The point on the curve  $y = x^2$  with  $x = 2$  is  $(x, y) = (2, 2^2) = (2, 4)$ . The slope of  $y = x^2$  at  $(x, y) = (2, 4)$  is  $2x = 4$ . The equation of the tangent line at  $(x, y) = (2, 4)$  is therefore

$$y = 4 + 4(x - 2) = 4x - 4.$$