

**Quiz Solution#4 for MA 113 - Calculus I**

Feb 19, 2015

This quiz is intended to help you prepare for the exams. Thus, you should attempt all questions and write their answers (including your explanations) in the space provided.

This quiz will not be collected or graded.

1. Assume that a function  $f$  is differentiable at  $x = 5$  and that the equation of the tangent line at the point  $(5, f(5))$  is given by  $y = -3x + 22$ . Determine the values of  $f(5)$  and  $f'(5)$ .

**Solution:**

Recall that the equation of the tangent line at the point  $(a, f(a))$  is given by  $y - f(a) = f'(a)(x - a)$ . Then we see that  $f'(5) = -3$  and  $f(5) - 5f'(5) = 22$ . So we see that  $f(5) = 22 - 3 \cdot 5 = 7$ .

2. Find the derivative of  $f(x) = 7x^5e^x$ .

**Solution:**

$$\frac{d}{dx}(7x^5e^x)$$

$$= \frac{d}{dx}(7x^5)e^x + 7x^5 \frac{d}{dx}e^x$$

$$= 7 \times 5x^4e^x + 7x^5e^x$$

$$= 7x^4(5 + x)e^x$$