MA119-A Applied Calculus for Business

2006 Fall

Practice Test of Midterm 1

(Only 10 Problems will be graded. You can choose any 10 Problems.)

1. (10pts) Evaluate the expression \( |2\sqrt{3} - 3| - |\sqrt{3} - 4| \).

2. (10pts) Factor the expression \( 8a^2 - 2ab - 6b^2 \).

3. (10pts) Find the real roots of the equation \( \frac{1}{2}a^2 + a - 12 = 0 \) by factoring.

4. (10pts) Find the distance between the given points \((-2, 1)\) and \((10, 6)\).

5. (10pts) Find an equation of the circle that satisfies the given conditions: center \((-a, a)\) and radius \(2a\).

6. (10pts) Find an equation of the line that passes through the point \((2, 4)\) and is perpendicular to the line \(3x + 4y - 22 = 0\).

7. (10pts) Evaluate \( h(2) \), where \( h = g \circ f \) and \( f(x) = \frac{1}{x-1} \) and \( g(x) = x^2 + 1 \).

8. (10pts) By cutting away identical squares from each corner of a rectangular piece of card board and folding up the resulting flaps, an open box may be made. If the card board is 15 in. long and 8 in. wide and the square cutaways have dimensions of \(x\) in. by \(x\) in., find a function giving the volume of the resulting box.

9. (10pts) Find the limit \( \lim_{x \to 0} \frac{2x^2 - 3x}{x} \) if it exists.

10. (10pts) Find the derivative of the function \( f(x) = \frac{x^3 + 2x^2 + x - 1}{x} \) by using the rules of differentiation.

11. (10pts) Find the slope and an equation of the tangent line to the graph of the function \( f(x) = -\frac{5}{3}x^2 + 2x + 2 \) at the point \((-1, -\frac{5}{3})\).

12. (10pts) Find the derivative of \( f(x) = (2x + 3)(3x - 4) \).