

MATH 203
Quiz I
Fall Semester

(50 minutes)

Name : _____

ID# : _____

1) (25 %)

Determine the linear functions of the following lines, then graph:

- a) Line passing through $(-2, 3)$ and perpendicular to $y = \frac{1}{2}x + 1$
- b) Tangent line to the graph of $y = x^2$ at $(-1, 1)$

2) (50 %)

A company's demand function for a certain product is given by:

$$q = D(p) = -p^2 + 4p + 12 \quad \text{where } p: \text{price of 1 unit in dollars}$$

$$q: \text{quantity demanded}$$

- a) Sketch the graph of the function.
- b) Using the graph, determine the restricted domain and restricted range.
- c) Interpret the p -intercept (located in restricted domain) and q -intercept.
- d) What would the price be in order for the company to produce 15 units.
- e) The supply function for this product is determined by the company to be

$$q = S(p) = p^2 + 6$$

Find the equilibrium price for 1 unit of this product.

3) (25 %)

The total cost, in \$, for producing x units is given by:

$$C(x) = x^3 + \frac{1}{2}x^2 - 2x + 20 \quad x \geq 1$$

- a) Determine the marginal cost.
- b) Find and interpret the marginal cost at $x = 20$ level of production.
- c) Find $C(20)$ and $C'(20)$ and interpret
- d) Deduce the approximate cost of the 21st unit.

$$8000 + 200 - 40 + 20$$

$$20 \quad 20 \quad 400$$

$$8000 + 200 - 40 + 20$$

$$8180$$

