Final Exam Review Math 150

1) Evaluate MR(x) for $p(x) = -\frac{x}{10} + 3$ in dollars at the production level x = 25

2) Determine the equation of the tangent line to $f(x) = (3x-2)^4$ at (1 , 1)

3) Find f ′(x) if $f(x) = 5x^3 e^x$

4) Use implicit differentiation to find dy/dx: $3x^2 + 5x + 8y^3 = 0$

5) Determine E(p) given $d(p) = 1250 - p^2$ and price p = 5

6) Determine any inflection points, as ordered pairs: $f(x) = -x^3 + 9x^2 - 24x + 18$

7) Determine $\int (5\sqrt{x} - 2x^{3/2})dx$

8) Find the area under $f(x) = \frac{1}{\sqrt{x}}$ on [1 , 4]

9) Find the area bounded by: $y = x + 2$ *and* $y = x^2 - 4$

10) Given the supply function $s(x) = 0.05x^2 + 15$ and the demand function $d(x) = 2542 - 0.02x^2$ find the equilibrium point.

11) Given the supply function s(x) = 0.45x + 30 and the demand function d(x) = - 0.25x + 240 find the consumer's surplus

12) Find $f_x(1,2)$ *given* $f(x,y) = (7x-2y)^4$

13) Find $f_{xy}(x,y)$ *given* $f(x,y) = 5x^3 y + xe^y$

14) Evaluate: $\int_1^2 4x^3 y^2 dx$

15) Evaluate: $\int_0^3 \int_0^2 (6x^2 y - 9e^{2x} y)dxdy$ (keep answer exact!)

Answers:

1) MR(25) = –2

2) y = 12x –11

3) $5x^3e^x + 15x^2e^x = 5x^2e^x(3+x)$

4) $\frac{-6x-5}{24y^2}$ *or* $-\frac{6x+5}{24y^2}$

5) $E(p) = \frac{2p^2}{1250-p^2}$ E(5)=2/49 =0.041

6) Inflection point: (3,0)

7) $\frac{10x^{3/2}}{3} - \frac{4x^{5/2}}{5} + c$

8) Area = 2

9) 125/6

10) (190 , 1820)

11) $11,250

12) 756

13) $15x^2 + e^y$

14) $15y^2$

15) $\frac{369-81e^4}{4}$