MATH 112 – EXAM II Hints and Answers
Winter 2017

1. (a) (3 points) $\dfrac{dy}{dx} = 16(3 + x\ln(x))^{15}\left(x \cdot \dfrac{1}{x} + \ln(x)\right)$
   (b) (3 ponts) $A'(2) = \frac{2^2}{4+2} = \frac{4}{6} = \frac{2}{3}$
   (c) (2 points) ii

2. (a) (3 points) $\displaystyle\int \left(\frac{4}{7x} + 1000e^{0.01x}\right) dx = \frac{4}{7}\ln x + 100000e^{0.01x} + C$
   (b) (3 points) $\displaystyle\int (2x-5)^2\, dx = \int (4x^2 - 20x + 25)\, dx = \frac{4}{3}x^3 - 10x^2 + 25x + C$
   (c) (4 points) $\displaystyle\int_1^{25} 6\sqrt{x} - \frac{3}{2\sqrt{x}}\, dx = 484$

3. (a) (2 points) $t = 7, 12, 17$
   (b) (2 points) $t = 3, 10, 14, 19$
   (c) (2 points) $t = 3$ minutes
   (d) (2 points) $t = 10$ minutes
   (e) (3 points) 1.25 feet per minute
   (f) (1 point) from $t = 5$ to $t = 9$ minutes
   (3 points) ~ 14.75 feet
   (g) (4 points) from $t = 0$ to $t = 3$, altitude is decreasing and concave up; from $t = 7$ to $t = 10$, altitude is increasing and concave down.

4. (a) (3 points) Total revenue has a local max at $q = 331$ Objects.
   (b) (3 points) Total cost has a point of inflection at $q = 10$ Objects.
   (c) (2 points) Profit is maximized at $q = 30$ Objects.
   (d) (5 points) $FC =$\$5735