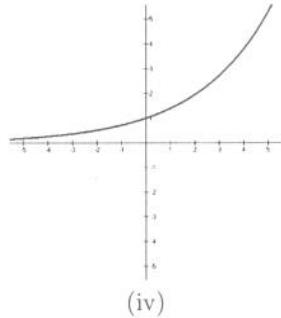
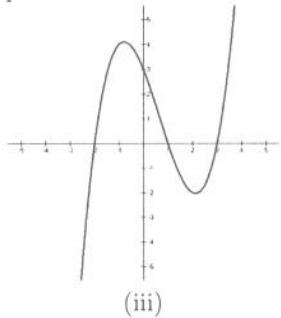
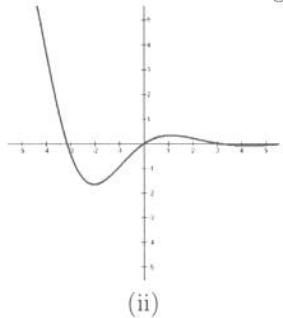
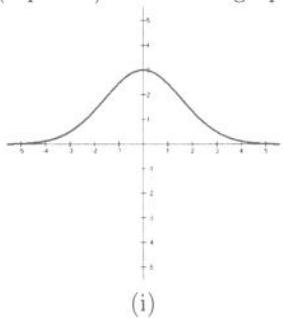


MATH 140: Quiz 2

Name: Ans Key

#1 (8 points) Match the graph of the function with the graph of its derivative.

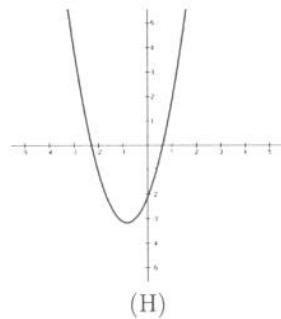
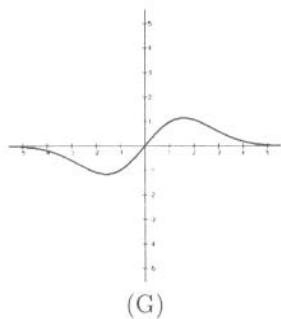
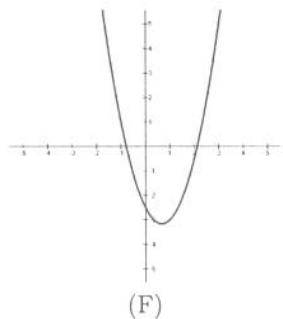
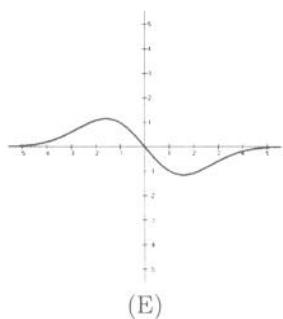
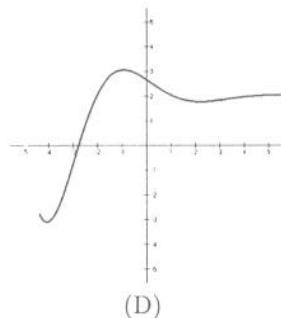
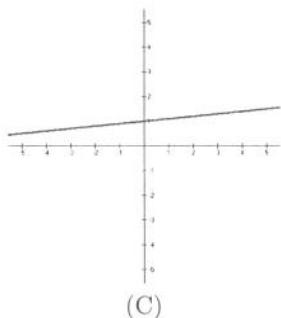
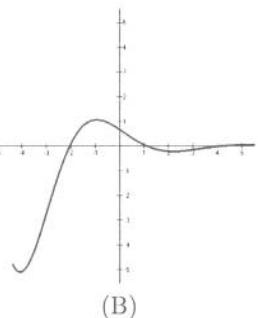
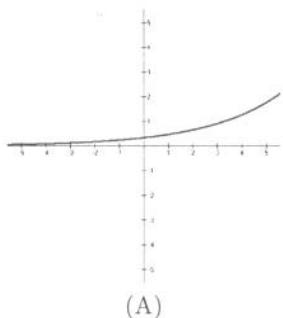


E

B

F

A



#2 (5 points). Given that $f(5) = 300$ and $f'(5) = 6$, give the equation of the line that locally approximates $f(x)$ near $x = 5$.

$$(y - y_0) = f'(x_0)(x - x_0)$$

$$\Rightarrow (y - 300) = 6(x - 5)$$

$$\Rightarrow y = 6x + 270$$

#3 Given the following data, where $C(q)$ and $R(q)$ are cost and revenue functions, respectively, of the quantity, q , produced:

q	10	20	30	40	50	60
$C(q)$	100	120	130	135	145	160
$R(q)$	60	100	135	145	150	153

a. (4 points) Estimate the marginal cost and marginal revenue at $q = 30$.

$$MC \approx \text{Average of } \frac{135-130}{10} = \frac{1}{2} \quad \& \quad \frac{130-120}{10} = 1 \Rightarrow MC = .75$$

$$MR \approx \text{Average of } \frac{145-135}{10} = 1 \quad \& \quad \frac{135-100}{10} = 3.5 \Rightarrow MR = 2.25$$

b. (2 points) If the company is currently producing 30 units, should it produce less, the same amount, or more? Why?

More since $MR > MC$

c. (2 points) Over the interval from 10 to 60, is $\frac{d^2R}{dq^2}$ positive, negative, or zero? Why?

Negative since the rate of change of R is slowing down.