

Quiz 2, Business Calculus

Summer Session I, 2012

10:11

10:15

4 min.

Name: Key

1. (4 points) Barney wants to manufacture purple dinosaur toys to sell to children. If he produces 30 toys, they cost \$50 per toy to make. For each toy produced beyond 30, the cost per toy drops by \$2.

(a) Calculate the total cost for Barney to make 35 toys.

(b) Let x be the number of toys beyond 30 that Barney makes, and assume $x \geq 0$. Find an expression in terms of x that gives the total production cost of the toys.

$$\begin{aligned} \text{(a) Total cost} &= (\text{price/toy}) \cdot (\# \text{ of toys}) \\ &= (50 - 2(5)) \cdot (35) \\ &= 40 \cdot 35 = \boxed{\$1400} \end{aligned}$$

$$\begin{aligned} \text{(b) Total cost} &= (50 - 2x) \cdot (30 + x) \\ &= 1500 - 60x + 50x - 2x^2 \\ C(x) &= \boxed{1500 - 10x - 2x^2} \end{aligned}$$

2. (3 points) Calculate $\lim_{x \rightarrow 4} \frac{x-4}{x^2-x-12}$. Show your work to receive full credit.

$$= \lim_{x \rightarrow 4} \frac{\cancel{(x-4)} \cdot 1}{\cancel{(x-4)}(x+3)}$$

$$= \lim_{x \rightarrow 4} \frac{1}{(x+3)}$$

$$= \boxed{\frac{1}{7}}$$

3. (3 points) Sketch the graph of $f(x) = \begin{cases} x+1 & \text{if } x \leq -2 \\ 4 & \text{if } -2 < x < 2 \\ 3x-2 & \text{if } x \geq 2 \end{cases}$

