

1) The Dogs-R-Us Company has calculated the cost to build doghouses to be \$50 each, plus a one-time set-up cost of \$2100. They plan to sell each doghouse for \$75.

- a) Find the cost function $C(x)$
- b) Find the revenue function $R(x)$
- c) Find the Profit function $P(x)$
- d) How many doghouses must be sold for them to break-even?
- e) Evaluate and Interpret $P(250)$
- f) Find and Interpret the average rate of change from $x = 100$ to $x = 150$

2) Joe's TV produces HD TV's. They have determined their cost function to be: $C(x) = -2x^2 + x + 10$, while their revenue function is $R(x) = x^2 + 9x - 6$. If x is the number of HD TV's produced find each:

- a) The profit function $P(x)$
- b) $P(2)$ and $P(10)$ and interpret
- c) $P'(x)$
- d) $P'(2)$ and $P'(10)$ and interpret

3) An appliance manufacturer has determined that the cost, in dollars, of producing x espresso makers is $C(x) = 3800 + 1.6x^{0.5}$. If the revenue from the sale of x espresso makers is given by $R(x) = 52x^{0.9}$, find the rate at which the average profit per espresso maker is changing when 70 espresso makers have been made and sold. Round to the nearest cent. (Interpret your answer)

4) Find the equation for the tangent line to $f(x) = \frac{-2x^2 + 6}{-3x - 2}$ at $x = 0$