

## Ch. 1.5 APPLICATIONS : LINEAR MODELS: COST & REVENUE FUNCTIONS

### Cost and Revenue Functions; Profit and Loss; Break-Even points

#### Cost Functions: $y = C(x)$

The total cost of producing an item typically consists of two parts  
the fixed cost that does not depend on the number of items produced  
the variable cost depends on the additional cost to produce an extra item

Total Cost = Fixed Cost + Variable Cost = Fixed Cost + (Marginal Cost)(number of items produced)

The y intercept is the \_\_\_\_\_

The slope is the \_\_\_\_\_

Discuss what might be some types of things included in fixed cost and in variable cost

#### Revenue Functions: $y = R(x)$ (“revenue” means “income”)

Revenue = price per item multiplied by the number of items sold

#### Profit = Revenue – Cost

$$P(x) = R(x) - C(x)$$

When Revenue = Cost, this is a Break Even point and profit = 0

If Revenue > Cost, there is a profit

If Revenue < Cost, there is a loss (the profit function is negative)

4 At Tony's Pizza Palace the fixed cost of making pizzas for one day is \$300. The variable cost to make a pizza is \$5 per pizza.

- Write the cost function for the total cost as a function of the number of pizzas made.
- If Tony expects to sell 60 pizzas on a typical day, what should he charge for a pizza in order to at least cover his costs?
- If Tony sells pizzas for \$15 each, how many pizzas does he need to sell in order to break even?
- If Tony sells 20 pizzas for \$15 each, what is his loss?
- If Tony sells 50 pizzas for \$15 each, what is his profit?

5. A factory makes decorative cell phone cases. It costs \$2000 to produce 100 cell phone cases and it costs \$5000 to produce 500 cell phone cases.

- Find the fixed and variable costs and write the cost function for producing cell phone cases.
- Suppose that the cell phone cases sell for \$10 each. Find the revenue function.
- How many items must be sold to break even?

6. Keisha makes jewelry and sells it online on Etsy. It costs her \$350 to produce 10 bracelets and it costs her \$950 to produce 40 bracelets. Keisha sells her bracelets for \$27.50 each. Find the cost and revenue functions and use them to determine how many she needs to sell in order to break even.