

Name:  
 Quiz 3  
 Math 151, Applied Calculus, Spring 2019

1. An online t-shirt retailer pays \$700 to start up a website and acquires t-shirt to sell at a price of \$5 per t-shirt, then sells the t-shirts at a price of \$12 each.
- (a) Give the cost  $C(q)$ , revenue  $R(q)$  and profit  $\pi(q)$  functions where  $q$  is the number of t-shirts sold.

$$C(q) = 700 + 5q \quad (2)$$

$$R(q) = 12q \quad (2)$$

$$\pi(q) = 12q - (700 + 5q)$$

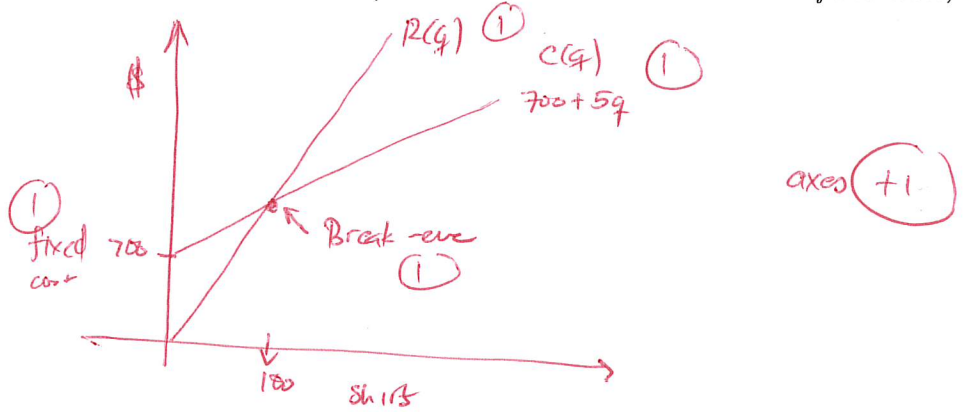
$$= 7q - 700 \quad (2)$$

- (b) How many t-shirts does the retailer need to sell to break even?

$$R(q) = C(q) \quad \text{or} \quad \pi(q) = 0$$

$$7q - 700 = 0 \quad q = 100 \text{ shirts} \quad (2)$$

- (c) Sketch the cost and revenue functions on the same axis and label *fixed costs*, *break-even quantity*



2. Suppose the Demand equation is given by  $q = 100 - 2p$  and the Supply equation by  $q = 3p - 50$

- (a) Explain the economic significance of the Supply and Demand curves.

Supply ~~how many~~ relates to quantity  $q$  that manufacturers are willing to make for a price  $p$ . (1.5)

Demand relates quantity demanded by consumers to price. (1.5)

- (b) Find the equilibrium price and quantity

$$100 - 2p = 3p - 50$$

$$150 = 5p$$

$$30 = p \quad (2)$$

$$q = 100 - 2p$$

$$= 100 - 60$$

$$= 40 \quad (2)$$