

Quiz 5

Instructions:

- You may not consult any outside materials. You may not consult with your classmates.
- You **may** use a calculator.
- You have twenty-five minutes to complete the quiz.
- If you use additional sheets of paper, then please staple the sheets to the quiz. Also, please be sure to cut any whiskers from the additional sheets you use.

ACME produces widgets using the following production function:

$$Q = f(l, k) = \text{Min}\{2k, l\}$$

1. Derive the long run conditional factor demands for each input.
2. Derive the long run cost function for this firm.
3. Derive the short cost function for this firm. Assume that the firm has 10 units of capital.
4. Graph the firm's short and long run cost functions. Assume that the price of each input is \$10 per unit.
5. Graph the firm's MC, ATC, and AVC. (Once again, assume that the price of each input is \$10 per unit.)

1) $2k = Q$ $L = Q$
 $K = \frac{Q}{2}$

3) $Q_{SR} = \text{Min}\{20, L\}$
 $L = Q$ (only good until $Q \leq 20$)

2) $C_{LR} = w \cdot Q + r \cdot \frac{Q}{2}$
 $C_{LR} = \left[w + \frac{r}{2} \right] \cdot Q$

$C_{SR} = w \cdot Q + r \cdot \bar{K}$
(for $Q \leq 20$)

$C_{SR} = 10Q + 100$

