

## Applying the Elasticity Rules

$$P = \left( \frac{MC}{1 + \frac{1}{\eta}} \right)$$

## A Summary

$$MR = P \left( 1 + \frac{1}{\eta} \right)$$

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$

$$P = \left( \frac{MC}{1 + \frac{1}{\eta}} \right)$$

## Some Propositions

- We develop these elasticity relations to make some points about how a monopolist behaves.

## First Proposition

- The Monopolist will always price where demand is elastic, that is when  $\eta < -1$ .

## First Proposition

- The Monopolist will always price where demand is elastic, that is when  $\eta < -1$ .
- Profit maximization requires  $MR > 0$ .

$$MR = P \left( 1 + \frac{1}{\eta} \right)$$

## First Proposition

- The Monopolist will always price where demand is elastic, that is when  $\eta < -1$ .
- Profit maximization requires  $MR > 0$ .

$$MR = P \left( 1 + \frac{1}{\eta} \right)$$

$$1 + \frac{1}{\eta} > 0$$

## First Proposition

- The Monopolist will always price where demand is elastic, that is when  $\eta < -1$ .
- Profit maximization requires  $MR > 0$ .
- The only way that can be true is if  $\eta < -1$

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

$$1 + \frac{1}{\eta} > 0$$

## First Proposition

- The Monopolist will always price where demand is elastic, that is when  $\eta < -1$ .
- Profit maximization requires  $MR > 0$ .
- The only way that can be true is if  $\eta < -1$
- To illustrate why, compute MR for  $\eta = -2$  and  $\eta = -1/2$

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

$$1 + \frac{1}{\eta} > 0$$

$$MR = P\left(1 + \frac{1}{-2}\right) = \frac{1}{2}P$$

## First Proposition

- The Monopolist will always price where demand is elastic, that is when  $\eta < -1$ .
- Profit maximization requires  $MR > 0$ .
- The only way that can be true is if  $\eta < -1$
- To illustrate why, compute MR for  $\eta = -2$  and  $\eta = -1/2$

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

$$1 + \frac{1}{\eta} > 0$$

$$MR = P\left(1 + \frac{1}{-0.5}\right) = -P$$

## Second Proposition

- For the straight line demand curve, MR is zero midpoint between the origin and the quantity demanded at  $P = 0$ .

## Second Proposition

- For the straight line demand curve, MR is zero midpoint between the origin and the quantity demanded at  $P = 0$ .
- At the midpoint, we know  $\eta = -1$

## Second Proposition

- For the straight line demand curve, MR is zero midpoint between the origin and the quantity demanded at  $P = 0$ .
- At the midpoint, we know  $\eta = -1$

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

## First Application

- Suppose a firm develops a cure for cancer: one pill a day, no side effects. **True or false:** there would be virtually no elasticity of demand for this wonder drug.

## First Application

- Suppose a firm develops a cure for cancer: one pill a day, no side effects. **True or false:** there would be virtually no elasticity of demand for this wonder drug.

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

## First Application

- Suppose a firm develops a cure for cancer: one pill a day, no side effects. **True or false:** there would be virtually no elasticity of demand for this wonder drug.

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

- **False**

## Second Application

- **True or false:** a monopolist always faces inelastic demand

## Second Application

- **True or false:** a monopolist always faces inelastic demand.

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

## Second Application

- **True or false:** a monopolist always faces inelastic demand.

$$MR = P\left(1 + \frac{1}{\eta}\right)$$

- **False**

### Third Application

- Wilma Trotter has shows that a new product has a price elasticity of demand of  $-1.25$ . It will cost \$10 to make the product. How should the product be priced?

### Third Application

- Wilma Trotter has shows that a new product has a price elasticity of demand of  $-1.25$ . It will cost \$10 to make the product. How should the product be priced?

$$P = \left( \frac{MC}{1 + \frac{1}{\eta}} \right)$$

### Third Application

- Wilma Trotter has shows that a new product has a price elasticity of demand of  $-1.25$ . It will cost \$10 to make the product. How should the product be priced?

$$P = \left( \frac{MC}{1 + \frac{1}{\eta}} \right)$$

$$P = \left( \frac{10}{1 + \frac{1}{-1.25}} \right)$$

### Third Application

- Wilma Trotter has shows that a new product has a price elasticity of demand of  $-1.25$ . It will cost \$10 to make the product. How should the product be priced?

$$P = \left( \frac{10}{1 + \frac{1}{-1.25}} \right)$$

$$P = \left( \frac{10}{1 - 0.8} \right) = \frac{10}{0.2}$$

### Third Application

- Wilma Trotter has shows that a new product has a price elasticity of demand of  $-1.25$ . It will cost \$10 to make the product. How should the product be priced?

$$P = \left( \frac{10}{1 - 0.8} \right) = \frac{10}{0.2}$$

- \$50

### Fourth Application

- The following data display retail prices and wholesale costs for two products. What are the price elasticities of demand?

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	?
New Car	\$20,000	\$19,000	?

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	?
New Car	\$20,000	\$19,000	?

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$



Applying the Elasticity Rules

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	$\frac{P - MC}{P} = -\frac{1}{\eta}$
New Car	\$20,000	\$19,000	?

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$



Applying the Elasticity Rules

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	$\frac{100 - 50}{100} = -\frac{1}{\eta}$
New Car	\$20,000	\$19,000	?

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$



Applying the Elasticity Rules

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	$\frac{1}{2} = -\frac{1}{\eta}$
New Car	\$20,000	\$19,000	?

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$



Applying the Elasticity Rules

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	$\eta = -2$
New Car	\$20,000	\$19,000	?

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$



Applying the Elasticity Rules

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	$\eta = -2$
New Car	\$20,000	\$19,000	$\frac{P - MC}{P} = -\frac{1}{\eta}$

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$



Applying the Elasticity Rules

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
	20000	19000	$\frac{1}{\eta} = -\frac{1}{2}$
Woman's Dress	20000		$\eta = -2$
New Car	\$20,000	\$19,000	

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	$\eta = -2$
New Car	\$20,000	\$19,000	$\frac{1}{20} = -\frac{1}{\eta}$

$$\frac{P - MC}{P} = -\frac{1}{\eta}$$

### Fourth Application

Item	Retail Price	Wholesale Price	Elasticity
Woman's Dress	\$100	\$50	$\eta = -2$
New Car	\$20,000	\$19,000	$\eta = -20$

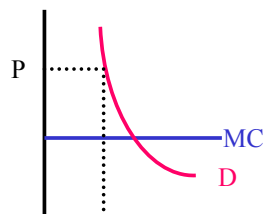
$$\frac{P - MC}{P} = -\frac{1}{\eta}$$

### Fifth Application

- Suppose it costs a monopolist \$10 to make a product. True or false: If demand increases the monopolist will raise the price.

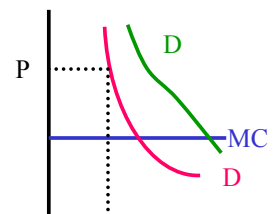
### Fifth Application

- Suppose it costs a monopolist \$10 to make a product. True or false: If demand increases the monopolist will raise the price.



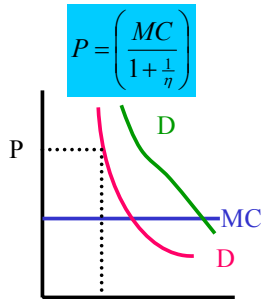
### Fifth Application

- Suppose it costs a monopolist \$10 to make a product. True or false: If demand increases the monopolist will raise the price.



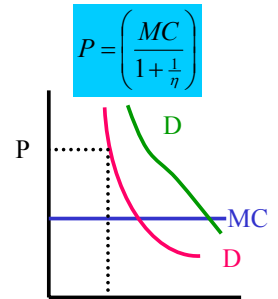
### Fifth Application

- Suppose it costs a monopolist \$10 to make a product. **True or false:** If demand increases the monopolist will raise the price.



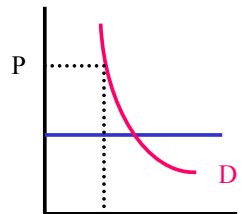
### Fifth Application

- Suppose it costs a monopolist \$10 to make a product. **True or false:** If demand increases the monopolist will raise the price.
- It Depends



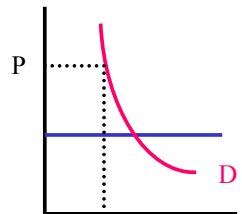
### Sixth Application

- Suppose it costs a monopolist \$10 to make a product. **True or false:** If demand increases the monopolist will make more money



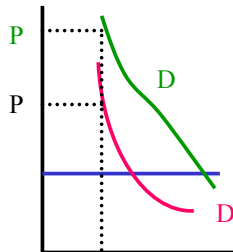
### Sixth Application

- Suppose it costs a monopolist \$10 to make a product. **True or false:** If demand increases the monopolist will make more money



### Sixth Application

- Suppose it costs a monopolist \$10 to make a product. **True or false:** If demand increases the monopolist will make more money



• True

### Seventh Application

- True or false:** it is a fair question on an exam to ask you to draw a monopolist's supply curve.

## Seventh Application

- **True or false:** it is a fair question on an exam to ask you to draw a monopolist's supply curve.
- A fair question, but the monopolist never has a supply curve.

## Seventh Application

- **True or false:** it is a fair question on an exam to ask you to draw a monopolist's supply curve.
- A fair question, but the monopolist never has a supply curve.
- The amount supplied at a given price depends on elasticity, not just price.

End