

**1. Problem**

Consider the following inverse demand function:  $p(x) = 24 - 0.5 \cdot x$  for the price  $p$  given the demanded quantity  $x$ . What is the price elasticity of demand at a price of  $p = 14$ ?

- (a)  $-0.714$
- (b)  $-1.621$
- (c)  $-2.063$
- (d)  $-1.740$
- (e)  $-1.400$

**Solution**

First, we obtain the demand function by inverting the inverse demand function:  $x = D(p) = (24 - p)/0.5 = 48 - 2 \cdot p$ .

Then, at  $p = 5$  the price elasticity of demand is

$$\frac{D'(p)}{D(p)}p = \frac{-2}{20}14 = -1.4.$$

- (a) False
- (b) False
- (c) False
- (d) False
- (e) True

**2. Problem**

Consider the following inverse demand function:  $p(x) = 47 - 1 \cdot x$  for the price  $p$  given the demanded quantity  $x$ . What is the price elasticity of demand at a price of  $p = 12$ ?

- (a)  $-2.009$
- (b)  $-1.295$
- (c)  $-2.196$
- (d)  $-0.343$
- (e)  $-2.917$

**Solution**

First, we obtain the demand function by inverting the inverse demand function:  $x = D(p) = (47 - p)/1 = 47 - 1 \cdot p$ .

Then, at  $p = 5$  the price elasticity of demand is

$$\frac{D'(p)}{D(p)}p = \frac{-1}{35}12 = -0.342857.$$

- (a) False
- (b) False
- (c) False
- (d) True
- (e) False

**3. Problem**

Consider the following inverse demand function:  $p(x) = 28 - 0.5 \cdot x$  for the price  $p$  given the demanded quantity  $x$ . What is the price elasticity of demand at a price of  $p = 13$ ?

- (a)  $-0.969$
- (b)  $-0.799$
- (c)  $-1.154$
- (d)  $-0.867$
- (e)  $-0.901$

**Solution**

First, we obtain the demand function by inverting the inverse demand function:  $x = D(p) = (28 - p)/0.5 = 56 - 2 \cdot p$ .

Then, at  $p = 5$  the price elasticity of demand is

$$\frac{D'(p)}{D(p)}p = \frac{-2}{30}13 = -0.866667.$$

- (a) False
- (b) False
- (c) False
- (d) True
- (e) False

**4. Problem**

Consider the following inverse demand function:  $p(x) = 14 - 0.1 \cdot x$  for the price  $p$  given the demanded quantity  $x$ . What is the price elasticity of demand at a price of  $p = 6$ ?

- (a)  $-0.750$
- (b)  $-0.835$
- (c)  $-1.333$
- (d)  $-1.090$
- (e)  $-0.971$

**Solution**

First, we obtain the demand function by inverting the inverse demand function:  $x = D(p) = (14 - p)/0.1 = 140 - 10 \cdot p$ .

Then, at  $p = 6$  the price elasticity of demand is

$$\frac{D'(p)}{D(p)}p = \frac{-10}{80}6 = -0.75.$$

- (a) True
- (b) False
- (c) False
- (d) False
- (e) False

**5. Problem**

Consider the following inverse demand function:  $p(x) = 29 - 0.6 \cdot x$  for the price  $p$  given the demanded quantity  $x$ . What is the price elasticity of demand at a price of  $p = 11$ ?

- (a)  $-0.917$
- (b)  $-0.611$
- (c)  $-0.356$

(d)  $-1.636$

(e)  $-1.563$

**Solution**

First, we obtain the demand function by inverting the inverse demand function:  $x = D(p) = (29 - p)/0.6 = 48.333333 - 1.666667 \cdot p$ .

Then, at  $p = 5$  the price elasticity of demand is

$$\frac{D'(p)}{D(p)}p = \frac{-1.666667}{30}11 = -0.611111.$$

(a) False

(b) True

(c) False

(d) False

(e) False