

## Example 5.2

```
Off[General::spell];  
Off[General::spell1];  
SetOptions[Plot, DefaultFont -> {"Times", 10}];
```

### ■ Get Demand Function (2 forms) and Plot

Enter Elasticity and a Demand Point;

```
elast = -0.5;  
pbase = 4.;  
qbase = 50000;
```

### ■ Calculate linear and log parameters

```
slope = elast * qbase / pbase;  
incpt = qbase - slope * pbase;  
const = qbase / (pbase^elast);
```

### ■ Linear (q form given first, then inverted for p (mb) form)

```
qlin = slope * plin + incpt
```

```
75000. - 6250. plin
```

```
mblin = plin /. (Flatten[Simplify[Solve[q == qlin, plin]]])
```

```
12. - 0.00016 q
```

```
qlin /. plin -> 3033.33333
```

```
-1.88833 × 107
```

### ■ Log (q form given first, then inverted for p (mb) form)

```
qlog = const * plog^elast
```

```

$$\frac{100000.}{plog^{0.5}}$$

```

```
mblog = Simplify[(q / const)^(1 / elast)]
```

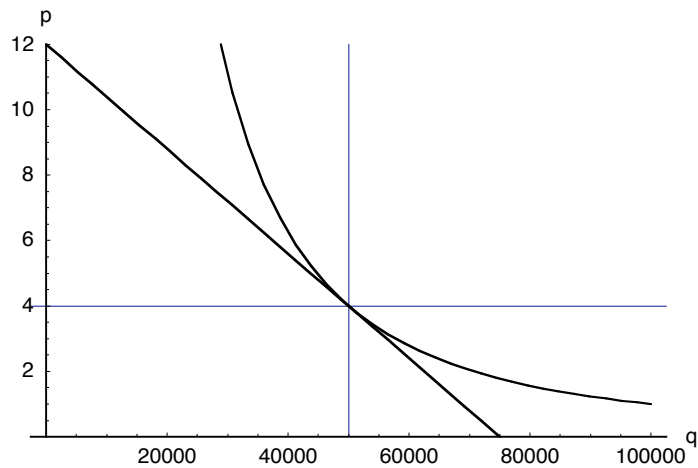
```

$$\frac{1. \times 10^{10}}{q^2.}$$

```

■ Plot Both Functions

```
Plot[{mblin, mblog}, {q, 0, 2 * qbase},
  PlotRange -> {0, 3 * pbase},
  AxesLabel -> {"q", "p"},
  GridLines -> {{qbase}, {pbase}}
]
```



- Graphics -

■ Copy Demand Function from above into integral

$$\int_{30000.}^{50000.} \left( \frac{1. * 10}{W^2.} \right) dW$$

133333.

```
TC[w_] := 60000. + 3. * w - 0.000003 * w^2.;
```

```
TC[50000]
```

202500.

```
TC[30000]
```

147300.

```
TC[50000] - TC[30000]
```

55200.

```
133333 - 55200
```

78133