

63. Difference 12  
Product Min

$$x - y = 12$$

$$x = 12 + y$$

$$P = xy$$

$$P = (12 + y)y \quad 36 + P = \underline{y^2 + 12y + 36}$$

$$P = y^2 + 12y$$

$$P = (y + 6)^2 - 36$$

$$\underline{x = 6}$$

$$\underline{y = -6}$$

Min

$$R = \overset{\text{price}}{(36 + 2x)} \overset{\text{customers}}{(300 - 10x)} \quad \begin{matrix} 36 + 2(6) \\ = 48 \end{matrix}$$

$$R = 10800 - 360x + 600x - 20x^2$$

$$R = -20x^2 + 240x + 10800$$

$$R = -20(x^2 - 12x) + 10800$$

$$(-20)(36) + R = -20(x^2 - 12x + 36) + 10800$$

$$R = -20(x - 6)^2 + 11520$$

$$x = 6$$

## Quadratic Equations

Quadratic Function

$$y = x^2 - 5x + 6$$

Max/Min

Graph

Domain + Range

Intercepts

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{5 \pm \sqrt{25 - 4(1)(6)}}{2(1)}$$

$$= \frac{5 \pm \sqrt{1}}{2} = \frac{5 \pm 1}{2}$$

$$x = 3, 2$$

Quadratic Equation

$$0 = x^2 - 5x + 6$$

Solve for x.

$$a=1 \quad b=-5 \quad c=6$$

$$x^2 - 5x + 6 = 0$$

Mult 6

Add -5

$$\begin{array}{r} 6 \\ 1 \overline{) 6} \\ \underline{6} \\ 0 \end{array}$$

$$x^2 - 3x - 2x + 6 = 0$$

$$x(x-3) - 2(x-3) = 0$$

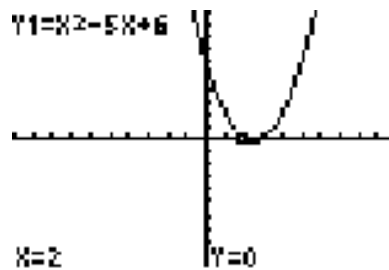
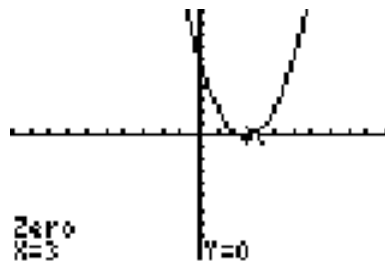
$$(x-2)(x-3) = 0$$

$$x-2=0 \quad \text{or} \quad x-3=0$$

$$x=2 \quad \rightarrow \quad x=3$$

# Solving by graphing

$0 = x^2 - 5x + 6$  → Make a function  
 $y = x^2 - 5x + 6$



$x^2 - 5x = -6$

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Plot1 Plot2 Plot3
Y1=X^2-5X
Y2=-6
Y3=
Y4=
Y5=
Y6=
Y7=
    
```

```

2nd 2nd 2nd 2nd
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
    
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