63. Difference 12
Product Min

$x - y = 12$

$x = 12 + y$

$P = xy$

$P = (12+y)y$

$P = y^2 + 12y$

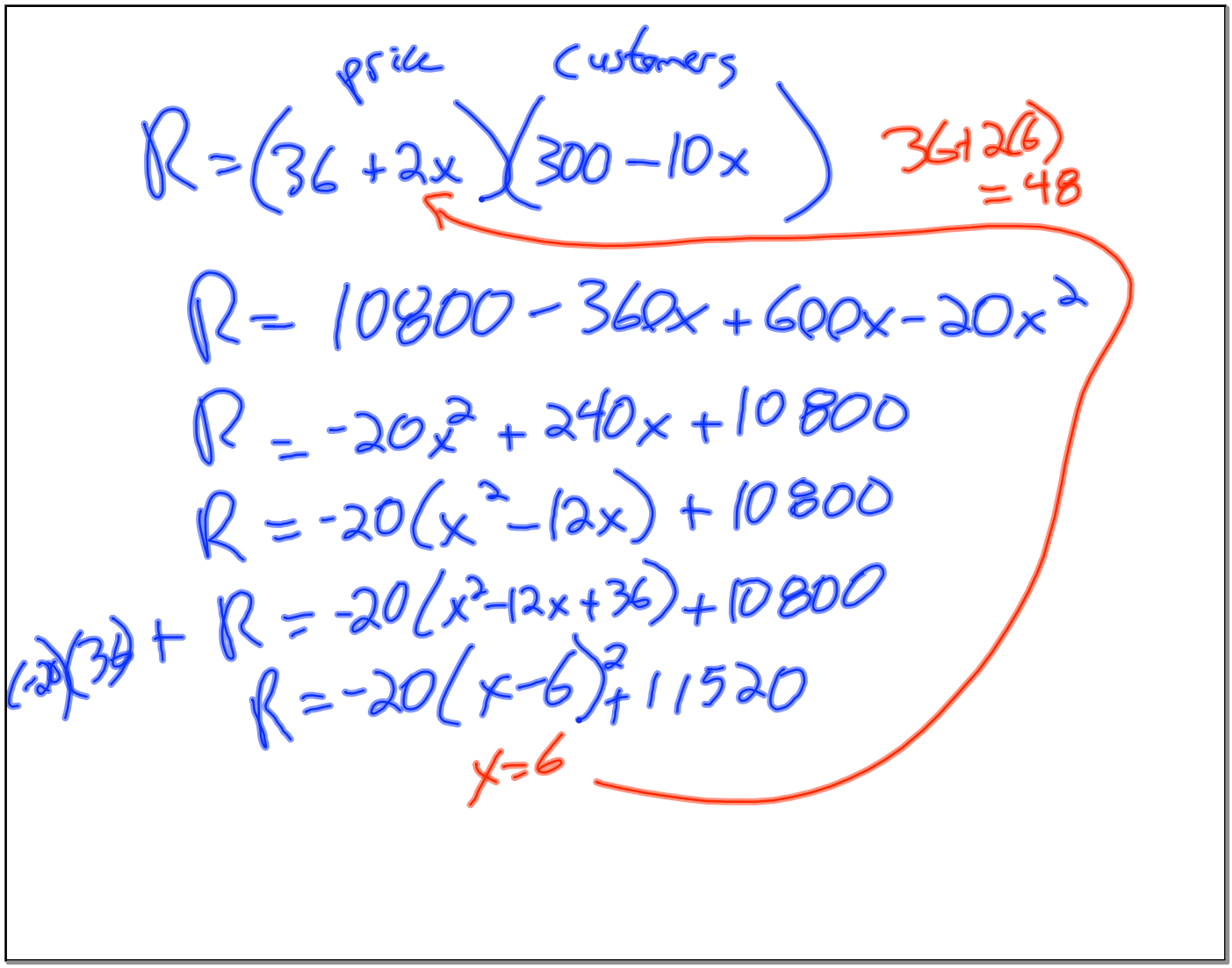
$36 + P = y^2 + 12y + 36$

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

Min

$y = -6$

$x = 6$


price
customers
$R = (36 + 2x)(300 - 10x)$
$36+12(6) = 48$
$R = 10800 - 360x + 600x - 20x^2$
$R = -20x^2 + 240x + 10800$
$R = -20(x^2 - 12x) + 10800$
$(-20)(36)$ +
$R = -20(x^2 - 12x + 36) + 10800$
$R = -20(x-6)^2 + 11520$
$x = 6$

Quadratic Equations

Quadratic Function

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

Max/Min

Graph

Domain & Range

Intercepts

Quadratic Equation

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

Solve for x.

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

$1x^2 - 5x + 6 = 0$

Mult 6

Add -5

6

$1, 6$

$2, 3$

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

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

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

$x - 2 = 0$ or $x - 3 = 0$

$x = 2$ or $x = 3$

$ax^2 + bx + c = 0$

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

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

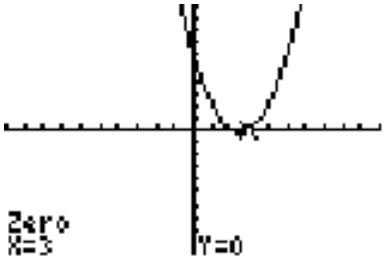
$$= \frac{5 \pm \sqrt{1}}{2} = \frac{5 \pm 1}{2}$$

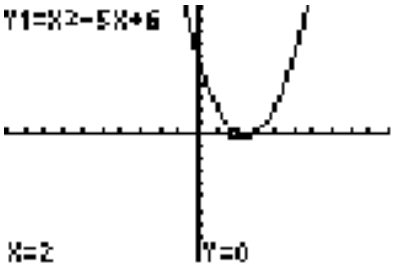
$x = 3, 2$

Solving by graphing

$0 = x^2 - 5x + 6$ → Make a function

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





$x^2 - 5x = -6$