9.

$R = (\$10)(70)$ let x = \$1 increase

$R = (\$10 + x)(70 - 5x)$

<u>maximize</u> sales

find vertex.

① GDC

② x-ints → axis of symmetry → y-value

$$R = (10 + x)(70 - 5x)$$

$$0 = (10 + x)(70 - 5x)$$

$$10 + x = 0$$
$$x = -10$$

$$70 - 5x = 0$$
$$-70 \qquad -70$$
$$\frac{-5x}{-5} = \frac{-70}{-5}$$
$$x = 14$$

$$x = \frac{-10 + 14}{2} = \frac{4}{2} = 2 \qquad x = 2$$

$$R = (12)(60) = \$720$$

p. 398

12.

let $x = \$1.5$ decrease

$R = (39)(63)$

$R = (39 - 1.5x)(63 + 7x)$

p. 392

8.

$A(x) = -2x^2 + 50x$

area 'y'

a) x-ints -> axis of symmetry -> vertex

$A(x) = -2x(x - 25)$

$0 = -2x(x - 25)$

$0 = -2x$ $\quad$ $x - 25 = 0$

$x = 0$ $\quad$ $x = 25$

$x = \frac{0 + 25}{2} = 12.5$ $\quad$ y-value = sub in!

p. 392

10 c.

partial factoring.

$y = 2x^2 + 10x + 7$

$y = 2x(x + 5) + 7$

$x = 0$ $\quad$ $x = -5$

$(0, 7)$ $\quad$ $(-5, 7)$

axis of symmetry

$x = \frac{0 + -5}{2} = -2.5$

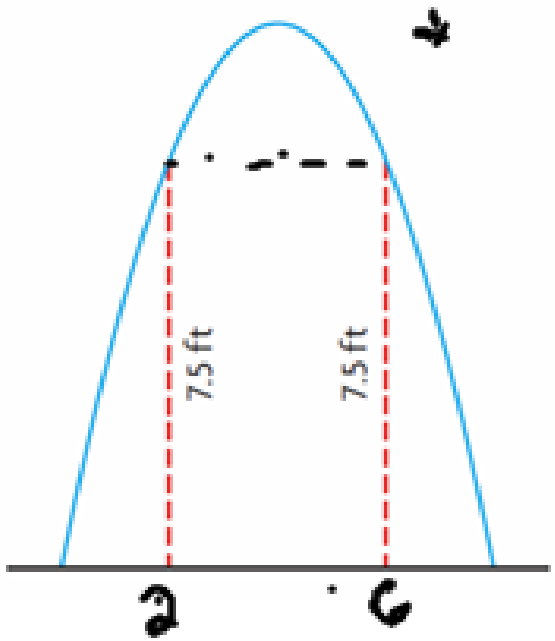
$y = 2(-2.5)^2 + 10(-2.5) + 7 = -5.5$

$(-2.5, -5.5)$

7.5 Solving Quadratic Equations by Factoring

$h(w) = -0.625w^2 + 5w$

Determine the distance between the two points on the arch that are 7.5 ft high.



$7.5 = -0.625w^2 + 5w$

$0 = \frac{-0.625w^2}{-0.625} + \frac{5w}{-0.625} - \frac{7.5}{-0.625}$

$0 = w^2 - 8w + 12$

$-6 \quad -2$

$0 = (w-6)(w-2)$

$w = 6 \qquad w = 2$

4 ft!

1 c.

$2y^2 + 11y + 5 = 0$

a . c $\quad 2 \cdot 5 = 10 \quad 10, 1$

$2y^2 + 1y + 10y + 5$

$y(2y+1) + 5(2y+1)$

$(y+5)(2y+1)$

EXAMPLE 3 Solving a quadratic equation with only one root

Solve and verify the following equation:

$$4x^2 + 28x + 49 = 0$$

$ax^2 + bx + c$

$4x^2 + 28x + 49 = 0$

$a \cdot c : (4)(49) = 196$

$14, 14$

$4x^2 + 14x + 14x + 49 = 0$

$2x(2x + 7) + 7(2x + 7) = 0$

$(2x + 7)(2x + 7)$

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