f) $\frac{1}{2}x^2 + 3x - 6 = 0$

$\frac{1}{2}(x^2 + 6x) - 6 = 0$

$\frac{1}{2}(x^2 + 6x + 9 - 9) - 6 = 0$

$\frac{1}{2}(x + 3)^2 - \frac{9}{2} - 6 = 0$

$\frac{1}{2}(x + 3)^2 - \frac{21}{2} = 0$

Section 4.3 Page 240 Question 4

a) $x^2 = 64$

$x = \pm 8$

b) $2s^2 - 8 = 0$

$2s^2 = 8$

$s = \pm 2$

c) $\frac{1}{3}t^2 - 1 = 11$

$\frac{1}{3}t^2 = 12$

$t^2 = 36$

$t = \pm 6$

d) $-y^2 + 5 = -6$

$y^2 = 11$

$y = \pm\sqrt{11}$

Section 4.3 Page 241 Question 5

a) $(x - 3)^2 = 4$

$x - 3 = \pm 2$

$x = 3 \pm 2$

$x = 3 + 2$ or $x = 3 - 2$

$x = 5$ $x = 1$

b) $(x + 2)^2 = 9$

$x + 2 = \pm 3$

$x = -2 \pm 3$

$x = -2 + 3$ or $x = -2 - 3$

$x = 1$ $x = -5$

c) $\left(d + \frac{1}{2}\right)^2 = 1$

$d + \frac{1}{2} = \pm 1$

$d = -\frac{1}{2} \pm 1$

$d = -\frac{1}{2} + 1$ or $d = -\frac{1}{2} - 1$

$d = \frac{1}{2}$ $d = -\frac{3}{2}$

d) $\left(h - \frac{3}{4}\right)^2 = \frac{7}{16}$

$h - \frac{3}{4} = \pm\sqrt{\frac{7}{16}}$

$h = \frac{3}{4} \pm \frac{\sqrt{7}}{4}$

$h = \frac{3 \pm \sqrt{7}}{4}$

e) $(s+6)^2 = \frac{3}{4}$

$$s+6 = \pm\sqrt{\frac{3}{4}}$$

$$s = -6 \pm \frac{\sqrt{3}}{2}$$

$$s = \frac{-12 \pm \sqrt{3}}{2}$$

f) $(x+4)^2 = 18$

$$x+4 = \pm\sqrt{18}$$

$$x = -4 \pm 3\sqrt{2}$$

Section 4.3 Page 241 Question 6

a) $x^2 + 10x + 4 = 0$

$$x^2 + 10x = -4$$

$$x^2 + 10x + 25 = -4 + 25$$

$$(x+5)^2 = 21$$

$$x+5 = \pm\sqrt{21}$$

$$x = -5 \pm \sqrt{21}$$

b) $x^2 - 8x + 13 = 0$

$$x^2 - 8x = -13$$

$$x^2 - 8x + 16 = -13 + 16$$

$$(x-4)^2 = 3$$

$$x-4 = \pm\sqrt{3}$$

$$x = 4 \pm \sqrt{3}$$

c) $3x^2 + 6x + 1 = 0$

$$x^2 + 2x + \frac{1}{3} = 0$$

$$x^2 + 2x = -\frac{1}{3}$$

$$x^2 + 2x + 1 = -\frac{1}{3} + 1$$

$$(x+1)^2 = \frac{2}{3}$$

$$x+1 = \pm\sqrt{\frac{2}{3}}$$

$$x = -1 \pm \frac{\sqrt{6}}{3}$$

$$x = \frac{-3 \pm \sqrt{6}}{3}$$

d) $-2x^2 + 4x + 3 = 0$

$$x^2 - 2x - \frac{3}{2} = 0$$

$$x^2 - 2x = \frac{3}{2}$$

$$x^2 - 2x + 1 = \frac{3}{2} + 1$$

$$(x-1)^2 = \frac{5}{2}$$

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

$$x = 1 \pm \frac{\sqrt{10}}{2}$$

$$x = \frac{2 \pm \sqrt{10}}{2}$$

e) $-0.1x^2 - 0.6x + 0.4 = 0$

$x^2 + 6x - 4 = 0$

$x^2 + 6x = 4$

$x^2 + 6x + 9 = 4 + 9$

$(x + 3)^2 = 13$

$x + 3 = \pm\sqrt{13}$

$x = -3 \pm \sqrt{13}$

f) $0.5x^2 - 4x - 6 = 0$

$x^2 - 8x - 12 = 0$

$x^2 - 8x = 12$

$x^2 - 8x + 16 = 12 + 16$

$(x - 4)^2 = 28$

$x - 4 = \pm\sqrt{28}$

$x = 4 \pm 2\sqrt{7}$

Section 4.3 Page 241 Question 7

a) $x^2 - 8x - 4 = 0$

$x^2 - 8x = 4$

$x^2 - 8x + 16 = 4 + 16$

$(x - 4)^2 = 20$

$x - 4 = \pm\sqrt{20}$

$x - 4 = \sqrt{20}$ or $x - 4 = -\sqrt{20}$

$x = 4 + \sqrt{20}$ $x = 4 - \sqrt{20}$

$x \approx 8.5$ $x \approx -0.5$

b) $-3x^2 + 4x + 5 = 0$

$x^2 - \frac{4}{3}x = \frac{5}{3}$

$x^2 - \frac{4}{3}x + \frac{4}{9} = \frac{5}{3} + \frac{4}{9}$

$\left(x - \frac{2}{3}\right)^2 = \frac{19}{9}$

$x - \frac{2}{3} = \pm\sqrt{\frac{19}{9}}$

$x = \frac{2 \pm \sqrt{19}}{3}$

$x = \frac{2 + \sqrt{19}}{3}$ or $x = \frac{2 - \sqrt{19}}{3}$

$x \approx 2.1$ $x \approx -0.8$

c) $\frac{1}{2}x^2 - 6x - 5 = 0$

$$x^2 - 12x = 10$$
$$x^2 - 12x + 36 = 10 + 36$$
$$(x - 6)^2 = 46$$
$$x - 6 = \pm\sqrt{46}$$

$x - 6 = \sqrt{46}$ or $x - 6 = -\sqrt{46}$

$x = 6 + \sqrt{46}$ $\quad$ $x = 6 - \sqrt{46}$

$x \approx 12.8$ $\quad$ $x \approx -0.8$

d) $0.2x^2 + 0.12x - 11 = 0$

$$x^2 + 0.6x = 55$$
$$x^2 + 0.6x + 0.09 = 55 + 0.09$$
$$(x + 0.3)^2 = 55.09$$
$$x + 0.3 = \pm\sqrt{55.09}$$

$x + 0.3 = \sqrt{55.09}$ or $x + 0.3 = -\sqrt{55.09}$

$x = -0.3 + \sqrt{55.09}$ $\quad$ $x = -0.3 - \sqrt{55.09}$

$x \approx 7.1$ $\quad$ $x \approx -7.7$

e) $-\frac{2}{3}x^2 - x + 2 = 0$

$$x^2 + \frac{3}{2}x = 3$$
$$x^2 + \frac{3}{2}x + \frac{9}{16} = 3 + \frac{9}{16}$$
$$\left(x + \frac{3}{4}\right)^2 = \frac{57}{16}$$
$$x + \frac{3}{4} = \pm\sqrt{\frac{57}{16}}$$
$$x = \frac{-3 \pm \sqrt{57}}{4}$$

$x = \frac{-3 + \sqrt{57}}{4}$ or $x = \frac{-3 - \sqrt{57}}{4}$

$x \approx 1.1$ $\quad$ $x \approx -2.6$

f) $\frac{3}{4}x^2 + 6x + 1 = 0$

$$x^2 + 8x = -\frac{4}{3}$$

$$x^2 + 8x + 16 = -\frac{4}{3} + 16$$

$$(x + 4)^2 = \frac{44}{3}$$

$$x + 4 = \pm\sqrt{\frac{44}{3}}$$

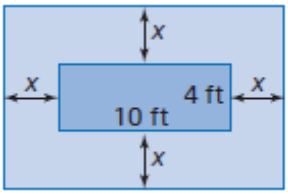
$x + 4 = \sqrt{\frac{44}{3}}$ or $x + 4 = -\sqrt{\frac{44}{3}}$

$x = -4 + \sqrt{\frac{44}{3}}$ $\quad$ $x = -4 - \sqrt{\frac{44}{3}}$

$x \approx -0.2$ $\quad$ $x \approx -7.8$

Section 4.3 Page 241 Question 8

a) Let x represent the distance added to each side of the kennel.



b) An equation that models the new area is $80 = (4 + 2x)(10 + 2x)$ or $0 = 4x^2 + 28x - 40$.

c) $4x^2 + 28x - 40 = 0$

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

$$x^2 + 7x + \frac{49}{4} = 10 + \frac{49}{4}$$

$$\left(x + \frac{7}{2}\right)^2 = \frac{89}{4}$$

$$x + \frac{7}{2} = \pm\sqrt{\frac{89}{4}}$$

$$x = \frac{-7 \pm \sqrt{89}}{2}$$

$x = \frac{-7 + \sqrt{89}}{2}$ or $x = \frac{-7 - \sqrt{89}}{2}$

$x \approx 1.2$ $\quad$ $x \approx -8.2$

Since the distance added to the kennel cannot be negative, $x = -8.2$ is an extraneous root. The dimensions of the new kennel are $4 + 2(1.2)$, or 6.4 ft, by $10 + 2(1.2)$, or 12.4 ft.