Quadratic Formula

p270 14-25, 33-36, 41-43

Key

(14) $x^2+45x=-200$

$x^2+45x+200=0$

$x=\frac{-45\pm\sqrt{(45)^2-4(1)(200)}}{2(1)}$

$=\frac{-45\pm\sqrt{1225}}{2}$

$=\frac{-45\pm35}{2}$

$\boxed{x=-5,-40}$

(15) $4x^2-6=-12x$

$4x^2+12x-6=0$

$x=\frac{-12\pm\sqrt{(12)^2-4(4)(-6)}}{2(4)}$

$=\frac{-12\pm\sqrt{240}}{8}$

$=\frac{-12\pm4\sqrt{15}}{8}$

$\boxed{x=\frac{-3\pm\sqrt{15}}{2}}$

(16) $3x^2-4x-8=-6$

$3x^2-4x-2=0$

$x=\frac{4\pm\sqrt{(-4)^2-4(3)(-2)}}{2(3)}$

$=\frac{4\pm\sqrt{40}}{6}$

$=\frac{4\pm2\sqrt{10}}{6}$

$\boxed{x=\frac{2\pm\sqrt{10}}{3}}$

(17) $4x^2-9=-7x-4$

$4x^2+7x-5=0$

$x=\frac{-7\pm\sqrt{(7)^2-4(4)(-5)}}{2(4)}$

$=\frac{-7\pm\sqrt{129}}{8}$

$\boxed{x=\frac{-7\pm\sqrt{129}}{8}}$

(18) $5x^2-9=11x$

$5x^2-11x-9=0$

$x=\frac{11\pm\sqrt{(-11)^2-4(5)(-9)}}{2(5)}$

$=\frac{11\pm\sqrt{301}}{10}$

$\boxed{x=\frac{11\pm\sqrt{301}}{10}}$

(19) $12x^2+9x-2=-17$

$12x^2+9x+15=0$

$x=\frac{-9\pm\sqrt{(9)^2-4(12)(15)}}{2(12)}$

$=\frac{-9\pm\sqrt{-639}}{24}$

$=\frac{-9\pm3i\sqrt{71}}{24}$

$\boxed{x=\frac{-3\pm i\sqrt{71}}{8}}$

zeros ↓ *No −values

MAX ↓ y-int

(20) (a) D = [0, 2] R = [0, 10]

(b) $-4.9t^2 + 3t + 10 = 0$

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(-4.9)(10)}}{2(-4.9)}$$

$$= \frac{-3 \pm \sqrt{205}}{-9.8}$$

$x = -1.15, 1.77$

About 1.77 seconds

(21) $2x^2 + 3x - 3 = 0$

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

$9 + 24 = \boxed{33}$

(b) 2 Real

(c) $x = \frac{-3 \pm \sqrt{(3)^2 - 4(2)(-3)}}{2(2)}$

$$\boxed{x = \frac{-3 \pm \sqrt{33}}{4}}$$

(22) $4x^2 - 6x + 2 = 0$

(a) $(-6)^2 - 4(4)(2)$

$= 36 - 32 = \boxed{4}$

(b) 2 Real

(c) $x = \frac{6 \pm \sqrt{(-6)^2 - 4(4)(2)}}{2(4)}$

$= \frac{6 \pm \sqrt{4}}{8}$

$= \frac{6 \pm 2}{8}$

$\boxed{x = 1, \frac{1}{2}}$

(23) $6x^2 + 5x - 1 = 0$

(a) $5^2 - 4(6)(-1)$

$25 + 24 = \boxed{49}$

(b) 2 Real

(c) $x = \frac{-5 \pm \sqrt{49}}{2(6)}$

$= \frac{-5 \pm 7}{12}$

$\boxed{x = \frac{1}{6}, -1}$

(24) $6x^2 - x - 5 = 0$

(a) $(-1)^2 - 4(6)(-5)$

$= 1 + 120 = \boxed{121}$

(b) 2 Real

(c) $x = \frac{1 \pm \sqrt{121}}{2(6)}$

$= \frac{1 \pm 11}{12}$

$\boxed{x = 1, -\frac{5}{6}}$

(25) $3x^2 - 3x + 8 = 0$

(a) $(-3)^2 - 4(3)(8)$

$= 9 - 96 = \boxed{-87}$

(b) 2i

(c) $x = \frac{3 \pm \sqrt{-87}}{2(3)}$

$$\boxed{x = \frac{3 \pm i\sqrt{87}}{6}}$$

33 $25 = -16t^2 + 35t + 5$

$-16t^2 + 35t - 20 = 0$

(a) 0

(b) $-16t^2 + 35t + 5 = 0$

$$x = \frac{-35 \pm \sqrt{35^2 - 4(-16)(5)}}{2(-16)}$$

$$= \frac{-35 \pm \sqrt{1545}}{-32}$$

$x = -.13, 2.32$

About 2.32 seconds

34 $.00005x^2 - .06x = 0$

$$x = \frac{.06 \pm \sqrt{(-.06)^2 - 4(.00005)(0)}}{2(.00005)}$$

$$= \frac{.06 \pm \sqrt{.0036}}{.0001}$$

$x = 1200, 0$

0 ft and 1200 ft

35 $5x^2 + 8x = 0$

(a) $8^2 - 4(5)(0)$

$64 - 0 = 64$

(b) 2 Real

(c) $$x = \frac{-8 \pm \sqrt{64}}{2(5)}$$

$$= \frac{-8 \pm 8}{10}$$

$x = 0, \frac{-8}{5}$

36 $8x^2 = -2x + 1$

$8x^2 + 2x - 1 = 0$

(a) $2^2 - 4(8)(-1)$

$4 + 32 = 36$

(b) 2 Real

(c) $$x = \frac{-2 \pm \sqrt{36}}{2(8)}$$

$$= \frac{-2 \pm 6}{16}$$

$x = \frac{1}{4}, \frac{-1}{2}$

41 (a) $-.26(15)^2 - .55(15) + 91.81$

$= -.26(225) - 8.25 + 91.81$

$= 25.06$ deaths

$-.26(17)^2 - .55(17) + 91.81$

$= -.26(289) - 9.35 + 91.81$

$= 7.32$ deaths

(b) $50 = -.26x^2 - .55x + 91.81$

$-.26x^2 - .55x + 41.81 = 0$

$$x = \frac{.55 \pm \sqrt{(.55)^2 - 4(-.26)(41.81)}}{2(-.26)}$$

$$= \frac{.55 \pm \sqrt{.30 + 43.48}}{-.52}$$

$$= \frac{.55 \pm \sqrt{43.78}}{-.52}$$

$x = -13.78, 11.67$

11.67

(c) No.

(42) $6666 = \frac{1}{2}n(n+1)$

$\frac{1}{2}n^2 + \frac{1}{2}n - 6666 = 0$

$X = \frac{-\frac{1}{2} \pm \sqrt{(\frac{1}{2})^2 - 4(\frac{1}{2})(6666)}}{2(\frac{1}{2})}$

$= \frac{-\frac{1}{2} \pm \sqrt{\frac{1}{4} + 1332}}{1}$

$= -\frac{1}{2} \pm \sqrt{1332\frac{1}{4}}$ $\frac{5329}{4}$

$X = 36, -37$

36 integers

(43) Jonathan

Tama did not move the 7 over.