Simplify each radical

$\sqrt{24} = \sqrt{4} \cdot \sqrt{6}$

$2\sqrt{6}$

$\sqrt{72} = \sqrt{36} \cdot \sqrt{2}$

$6\sqrt{2}$

$\sqrt{128}$

$\sqrt{64} \cdot \sqrt{2}$

$8\sqrt{2}$

$\sqrt{8^2 + 15^2}$

$\sqrt{64+225}$

$\sqrt{289} = 17$

$\frac{\sqrt{112}}{\sqrt{7}} = \sqrt{\frac{112}{7}}$

$= \sqrt{16} = 4$

Solve using the quadratic formula. Simplify all radicals and if the solution is complex leave in the form of *a+bi*.

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

$3x^2 - 5x + 1 = 0$

$$\frac{5 \pm \sqrt{(-5)^2-4(3)(1)}}{2(3)}$$

$$\frac{5 \pm \sqrt{25-12}}{6} = \frac{5 \pm \sqrt{13}}{6}$$

$$\frac{5}{6} \pm \frac{\sqrt{13}}{6}$$

$-3x^2 - 5x + 10 = 0$

$$\frac{5 \pm \sqrt{(-5)^2-4(-3)(10)}}{2(-3)}$$

$$\frac{5 \pm \sqrt{25-(-120)}}{-6}$$

$$\frac{5 \pm \sqrt{145}}{-6}$$

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

$$\frac{-2 \pm \sqrt{(2)^2-4(1)(5)}}{2(1)}$$

$$\frac{-2 \pm \sqrt{4-20}}{2}$$

$$\frac{-2 \pm \sqrt{-16}}{2} = \frac{-2 \pm 4i}{2} = -1 \pm 2i$$

$4x^2 + 8x - 1 = 0$

$$\frac{-8 \pm \sqrt{(8)^2-4(4)(-1)}}{2(4)}$$

$$\frac{-8 \pm \sqrt{64+16}}{8}$$

$$\frac{-8 \pm \sqrt{80}}{8}$$

$\sqrt{80} = \sqrt{16} \cdot \sqrt{5}$

$4\sqrt{5}$

$$\frac{-8 \pm 4\sqrt{5}}{8} = \frac{-2 \pm \sqrt{5}}{2}$$

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

Solve by factoring

$2x^2 + 19x + 24 = 0$

48
6·8
12·4
48·1
16·3

$(2x^2 + 16x) + (3x + 24) = 0$

$2x(x + 8) + 3(x + 8) = 0$

$(2x+3)(x+8) = 0$

$2x+3=0 \quad x+8=0$

$x = -\frac{3}{2} \quad x = -8$

$\frac{2x^2 + 16x - 130}{2} = \frac{0}{2}$

-65
-5·13

$x^2 + 8x - 65 = 0$

$(x^2 - 5x) + (13x - 65) = 0$

$x(x-5) + 13(x-5)$

$(x+13)(x-5) = 0$

$x = -13 \quad x = 5$

$x^2 - 20x = -51$

$(x^2 - 17x)(-3x + 51)$

$x^2 - 20x + 51 = 0$

$(x-17)(x-3) = 0$

$x(x-17) - 3(x-17)$

$x = 17 \quad x = 3$

-108
-27·4

$6x^2 - 23x - 18 = 0$

$(6x^2 - 27x) + (4x - 18) = 0$

$3x(2x-9) + 2(2x-9) = 0$

$(2x-9)(3x+2) = 0$

$2x-9=0 \quad 3x+2=0$

$2x = 9 \quad 3x = -2$

$x = \frac{9}{2} \quad x = -\frac{2}{3}$

Solve by any method

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

$\frac{-6 \pm \sqrt{(6)^2 - 4(1)(-3)}}{2(1)}$

$\frac{-6 \pm \sqrt{36 + 12}}{2} = \frac{-6 \pm \sqrt{48}}{2}$

$\sqrt{48} = \sqrt{16} \cdot \sqrt{3}$

$4\sqrt{3}$

$\frac{-6 \pm 4\sqrt{3}}{2}$

$\frac{4\sqrt{3}}{2}$

$-3 \pm 2\sqrt{3}$

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

$\frac{-8 \pm \sqrt{8^2 - 4(5)(-8)}}{2(5)}$

$\frac{-8 \pm \sqrt{64 - (-160)}}{10}$

$\frac{-8 \pm \sqrt{224}}{10} =$

$\sqrt{224} = \sqrt{16} \cdot \sqrt{14}$

$4\sqrt{14}$

$\frac{-8 \pm 4\sqrt{14}}{10} = \frac{-4 \pm 2\sqrt{14}}{5}$

$3x^2 + 8x = 3 \quad = 3x^2 + 8x - 3 = 0$

$(3x^2 - x) + (9x - 3) = 0$

$x(3x - 1) + 3(3x - 1) = 0$

$(3x - 1)(x + 3) = 0$

$x = \frac{1}{3} \quad x = -3$

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

-9

$-1 \cdot 9$

$\frac{-12}{-3 \cdot 4}$

$(2x^2 - 3x) + (4x - 6) = 0$

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

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

$2x - 3 = 0 \quad x + 2 = 0$

$2x = 3 \quad x = -2$

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

Preform the indicated operation. Write your answer in standard form $a+bi$

$2+3i+7-i$

$9+2i$

$2-6i-(-10+4i)$

$2-6i+10-4i$

$12-10i$

$-i+(8-2i)-(5-9i)$

$-i+8-2i-5+9i$

$3+6i$

$(30-i)-(18+6i)+30i$

$30-i-18-6i+30i$

$12+23i$

$i(3+i)-2i$ $\quad i^2=-1$

$3i+i^2-2i$

$3i-1-2i$

$-1+i$

$(5+i)(8-3i)$

$40-15i+8i-3i^2$

$40-7i+3(-1)$

$40-7i-3$

$37-7i$

Katie, a goalie for Riverside High School's soccer team, needs to get the ball downfield to her teammates on the offensive end of the field. She punts the ball from a point 2 feet above the ground with an initial upward velocity of 40 feet per second.

$h(t) = -16t^2 + V_0 t + h_0$

- Write a function rule that relates the ball's height above the ground to its time in the air. $h(t) = -16t^2 + 40t + 2$

$= -8t^2 + 20t + 1$

$\frac{-20 \pm \sqrt{20^2 - 4(-8)(1)}}{2(-8)}$

- Use the function rule to find the time when the ball hits the ground. $\frac{-20 \pm 20.78}{-16}$

2.55

- What time does the ball reach its maximum height? What is the maximum height?

$-\frac{b}{2a} = \frac{-20}{2(-8)} = \frac{-20}{-16} = \frac{5}{4} = 1.25$ sec

max height 27 ft