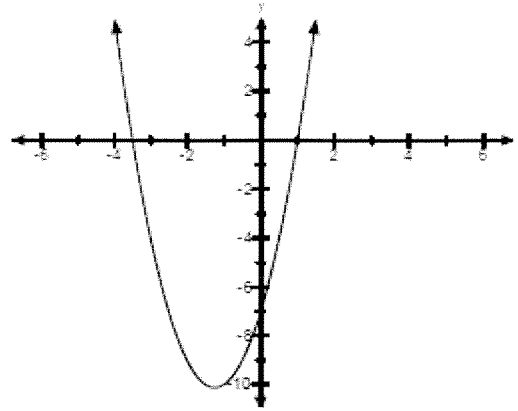


1. The graph of $y = 2x^2 + 5x - 7$ is given. Use it to approximate the roots of the equation: $2x^2 + 5x - 7 = 0$

$(-3.5, 0)$

And $(1, 0)$



- B. Solve a quadratic equation by factoring.

2. $\frac{6x^2 - 15x}{3x} = 0$

$3x(2x - 5) = 0$
 $3x = 0$ } $2x - 5 = 0$
 $x = 0$ } $x = \frac{5}{2}$

3. $3x^2 + 4x = 7$

$3x^2 + 4x - 7 = 0$
 $(3x + 7)(x - 1) = 0$
 $3x + 7 = 0$ } $x - 1 = 0$
 $\frac{3x + 7}{3} = \frac{-7}{3}$ } $x = 1$

4. $x^2 - 16 = 0$

$(x + 4)(x - 4) = 0$
 $x = -4$ } $x = 4$

- C. Determine the exact roots in simplest form. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

5. $3x(x - 2) = 5$

$3x^2 - 6x - 5 = 0$

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(-5)}}{2(3)}$

$= \frac{6 \pm \sqrt{36 + 60}}{6}$
 $= \frac{6 \pm \sqrt{96}}{6}$
 $= \frac{6 \pm 4\sqrt{6}}{6}$
 $= \frac{3 \pm 2\sqrt{6}}{3}$

6. $\frac{2x}{x+3} = \frac{4}{x}$

$x(2x) = 4(x+3)$

$2x^2 = 4x + 12$

$\frac{2x^2}{2} - \frac{4x}{2} - \frac{12}{2} = \frac{0}{2}$

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

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

$= \frac{2 \pm \sqrt{4 + 24}}{2}$

$x = \frac{2 \pm \sqrt{28}}{2}$
 $= \frac{2 \pm 2\sqrt{7}}{2}$
 $= \frac{1 \pm \sqrt{7}}{1}$

5. Lucas shoots an arrow into the air. Its height is defined by the function: $h(t) = -5t^2 + 25t + 2$, where h is the ball's height in meters and t is time in seconds.

a. At what time(s) is the ball's height 13 feet? **Nearest tenth**

$$\begin{aligned}
 -5t^2 + 25t + 2 &= 13 \\
 -5t^2 + 25t + 2 - 13 &= 0 \\
 -5t^2 + 25t - 11 &= 0 \\
 \frac{-5t^2 + 25t - 11}{-1} &= 0 \\
 5t^2 - 25t + 11 &= 0
 \end{aligned}$$

$$\begin{aligned}
 t &= \frac{25 \pm \sqrt{(25)^2 - 4(5)(11)}}{2(5)} \\
 &= \frac{25 \pm \sqrt{405}}{10} \\
 t &= \frac{25 + 20.1}{10} \text{ or } t = \frac{25 - 20.1}{10}
 \end{aligned}$$

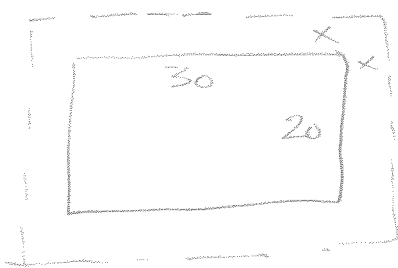
$t = 4.5$
And
 $t = .5$
(TWO TIMES)

b. For how long is the ball in the air? **Nearest tenth**

$$\begin{aligned}
 -5t^2 + 25t + \frac{2}{-1} &= \frac{0}{-1} \\
 5t^2 - 25t - 2 &= 0 \\
 t &= \frac{25 \pm \sqrt{25^2 - 4(5)(-2)}}{2(5)} \\
 &= \frac{25 \pm \sqrt{665}}{10} \\
 t &= \frac{25 \pm 25.8}{10} \\
 t &= 5.8 \text{ or } t = -0.8
 \end{aligned}$$

CAN'T BE NEG
CAN'T BE NEG

6. Brianna has a new rectangular pool that measures 20 feet by 30 feet. She decides to build a walkway, of uniform width, around the pool. If the total area is 1200 sq. feet, how wide is the walkway?



$$\begin{aligned}
 (30 + 2x)(20 + 2x) &= 1200 \\
 600 + 60x + 40x + 4x^2 &= 1200 \\
 \frac{4x^2 + 100x - 600}{4} &= 0 \\
 x^2 + 25x - 150 &= 0 \\
 (x + 30)(x - 5) &= 0
 \end{aligned}$$

$\therefore x \neq -30$
 $x = 5$

7. The sum of the squares of two consecutive even numbers is 100. Set up a quadratic equation and solve it to determine the two numbers.

Use n and $n+2$

$$\begin{aligned}
 (n)^2 + (n+2)^2 &= 100 \\
 n^2 + n^2 + 4n + 4 &= 100 \\
 \frac{2n^2 + 4n - 96}{2} &= 0 \\
 n^2 + 2n - 48 &= 0
 \end{aligned}$$

