

Pre-Calculus 11 - VLN

Chapter 3: Quadratic Equations

Lesson 3: Solving Quadratics by Completing the Square

Question #1

Reference Q.45614

Solve the equation $-5x^2 + 34 = -30x$

Question #2

Reference Q.45617

Solve the equation $-30x = 26 - 3x^2$.

Question #3

Reference Q.18647

Fill in the blank so that the equation $x^2 + bx + c = 0$ can be written as

$$\left(x + \frac{b}{2}\right)^2 = d.$$

a. $(x^2 + 2x + \underline{\hspace{1cm}} - \underline{\hspace{1cm}}) = 0 \Rightarrow (x + \underline{\hspace{1cm}})^2 = \underline{\hspace{1cm}}$

b. $(x^2 - 6x + \underline{\hspace{1cm}} - \underline{\hspace{1cm}}) = 0 \Rightarrow (x + \underline{\hspace{1cm}})^2 = \underline{\hspace{1cm}}$

c. $(x^2 + x + \underline{\hspace{1cm}} - \underline{\hspace{1cm}}) = 0 \Rightarrow (x + \underline{\hspace{1cm}})^2 = \underline{\hspace{1cm}}$

Question #4

Reference Q.18648

Fill in the blank so that the trinomial $ax^2 + bx + c = 0$ can be written as

$$a\left(x + \frac{b}{2a}\right)^2 = d.$$

a. $(2x^2 + 4x + \underline{\hspace{1cm}} - \underline{\hspace{1cm}}) = 0 \Rightarrow 2(x + \underline{\hspace{1cm}})^2 = \underline{\hspace{1cm}}$

b. $(-6x^2 - 12x + \underline{\hspace{1cm}} - \underline{\hspace{1cm}}) = 0 \Rightarrow -6(x + \underline{\hspace{1cm}})^2 = \underline{\hspace{1cm}}$

c. $(10x^2 - 10x + \underline{\hspace{1cm}} - \underline{\hspace{1cm}}) = 0 \Rightarrow 10(x - \underline{\hspace{1cm}})^2 = \underline{\hspace{1cm}}$

Question #5

Reference Q.11047

A baseball is hit into the air with an initial velocity of 85 mph. By using this velocity, and ignoring air friction, we can describe the height of the baseball by the equation $h(t) = -8t^2 + 19.2t + 34.08$, where height is in feet and time is in seconds.

a. What is the maximum height the ball reaches, and when does this occur?

b. How long will the ball be in the air until it hits the ground?

c. What is the height of the ball when it is initially struck?

Question #6

Reference Q.11048

The price of precious metals such as gold have been said to fluctuate in accordance with the following quadratic function $y = 3x^2 - 24x + 63$. Express that equation in vertex form.

Question #7

Reference Q.11051

A disoriented bird is flying in the trajectory of a quadratic equation given by $h(t) = -8t^2 + 15t + 10$ where $h(t)$ represents the height in feet at time t in seconds. Find when the bird will eventually land on the ground and also the height where it began flying from (where it perches. i.e. - the equation's y -intercept).

Question #8

Reference Q.18651

Solve the equation $2x^2 + 4x - 2 = 0$.

Question #9

Reference Q.18652

Solve the equation $5x^2 - 30x - 1 = 0$.

Question #10

Reference Q.18655

Solve the equation $-7x^2 = 14x - 21$.

Question #11

Reference Q.18653

Solve the equation $-\frac{1}{2}x^2 + 2x + \frac{1}{4} = 0$.

Question #12

Reference Q.11041

Find the roots of the following equation: $-3(x + 5)^2 + 27 = 0$.

🔗 Question #13

Reference Q.11043

Find the roots of the following equation: $5x^2 + 30x - 80 = 0$.

🔗 Question #14

Reference Q.11061

The sun's pattern of rising and falling can be shown at times to match the quadratic equation $f(t) = t^2 - 45t + 10$. Find the roots of this equation to find out the time when night-time begins and ends.

🔗 Question #15

Reference Q.18654

Solve the equation $ax^2 + bx + c = 0$, where $a \neq 0$, b and c are any real numbers.

🔗 Question #16

Reference Q.11049

You are told that the price, p , of petroleum (crude oil) will change in accordance with the quadratic function $p = -2t^2 - 8t - 9$, where t represents time. Without graphing, find the domain, range, and maximum or minimum value so you can find out what the maximum and minimum prices are and what range of values the price of petroleum can be. Also, determine whether the price of petroleum will ever reach \$0.

🔗 Question #17

Reference Q.11050

A satellite in space is flying around Jupiter in accordance with the equation $y = 4x^2 - 16x - 10$ and will crash into another satellite at the x value corresponding to its roots. Find the point at which it crashes into another satellite.