Pre-Calculus 11 - VLN

Chapter 3: Quadratic Equations

Lesson 4: The Quadratic Formula

Question #1

Reference Q.11052

Solve $y = 3x^2 + x - 5 = 0$ by using the quadratic formula.

Question #2

Reference Q.11053

Solve $x^2 + 14x + 6$ by completing the square, and then verify your answer with the quadratic formula.

Question #3

Reference Q.11054

Solve the equation $36x^2 - 81 = 0$ using the quadratic formula and verify using a difference of squares factoring method.

Question #4

Reference Q.11055

Solve the following equation with the quadratic formula:

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

Question #5

Reference Q.11056

Use the quadratic formula to determine what the zeroes are for the function $f(x) = 2x^2 - 25x + 70$ and how many times the graph crosses the x-axis.

Question #6

Reference Q.11058

Solve the following equation with the quadratic formula:

$0 = x^2 - 5x - 13.$

Question #7

Reference Q.11059

Solve the following equation with the quadratic formula:

$0 = 3x^2 + 7x + 12$

Question #8

Reference Q.11120

Engineers use quadratic formulas when building corners around highways. One such quadratic equation dealing with the "curvature" around a corner could look something like this:

$c(x) = -0.15x^2 + 2.01x + 30$

What position of x gives a curvature of 10?

Question #9

Reference Q.11060

Solve $5m^2 + 4m = 2m - 6$

Question #10

Reference Q.13777

The paved walkway from the main school building to the Physical Education block at a school is "L" shaped, with the total distance being 180 metres. A student, taking a short cut diagonally across the grass, shortens the distance to 130 m.

a. Draw a sketch to illustrate this information.

b. If one of the "L" shaped sides has a length of x metres, state the length of the other "L" shaped side in terms of x.

c. Use the Pythagorean Theorem to write a quadratic equation in x. Solve the equation to determine the length of the two legs of the paved walkway. Answer to the nearest tenth of a metre.

Question #11

Reference Q.11057

Use the quadratic formula to solve $2x^2 - 4x - 62 = 0$ and simplify as much as possible.

Question #12

Reference Q.11122

The tidal height in the Baltic Sea can be shown at times to match the quadratic equation $y = 2x^2 + 4.5x - 5$ where y is the height and x is the time.

At what time(s) is the tide at a height of 0?

Question #13

Reference Q.11124

In a pretend economy, the price of Canola is given by the quadratic equation
$p(t) = 4.5t^2 - 3.05t - 5.$ At what point is the price of Canola free?

Question #14

Reference Q.11125

Say that the costs of a specific kind of medical insurance are given by the quadratic equation
$C(t) = 3t^2 - 5t + 5.$
When is the cost of this medical insurance going to be free? If it's never going to be free, what will its lowest cost be?

Question #15

Reference Q.11126

Engineers use quadratic formulas when building and analyzing roller coasters. One such quadratic equation deals with a water slide's height around a corner like this:
$h(x) = -4x^2 + 2.04x + 115.$ What positions of x gives a height of 50?

Question #16

Reference Q.11121

A coffee-bean warehouse with an area of $3500 ft^2$ has dimensions such that the length is 40ft more than the width. What are the dimensions of the warehouse?

Question #17

Reference Q.11123

A small parking lot with an area of $3515 ft^2$ has dimensions such that the length is 30ft more than the width. Is it possible to have such a parking lot, and if so, what are its dimensions?

Question #18

Reference Q.13755

Form a quadratic equation and solve, Answer to the nearest tenth.

a. $x + \frac{1}{x} = 3,\ x \neq 0$

b. $(2x - 1)(3x + 2) = (x + 3)(2x + 1)$

Question #19

Reference Q.13756

Form a quadratic equation and solve. Give answers as exact values in simplest form

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

b. $3x(x - 4) = 8$

c. $3(x - 1)(x + 2) - (x^2 + 3) = 0$

Question #20

Reference Q.13757

Find a quadratic equation in simplest form which is equivalent to the given equation, but has integral coefficients. Hence find the roots of the given equation to the nearest tenth.

a. $1.4x^2 - 2.8x = 1.8$

b. $\frac{x^2}{2} - x - \frac{5}{4} = 0$