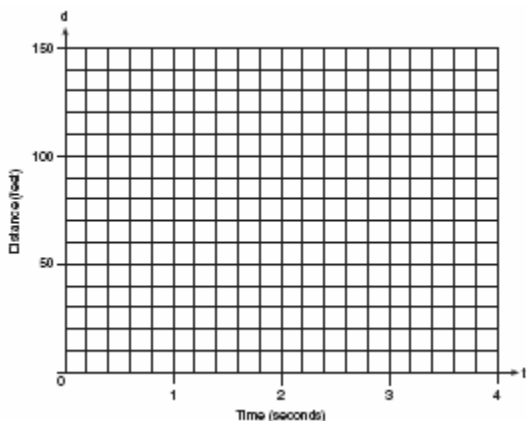


Lesson 10-3: Solving Quadratic Equations

Part 1: Solving Quadratic Equations by Graphing

1. 080234a, P.I. A.A.27

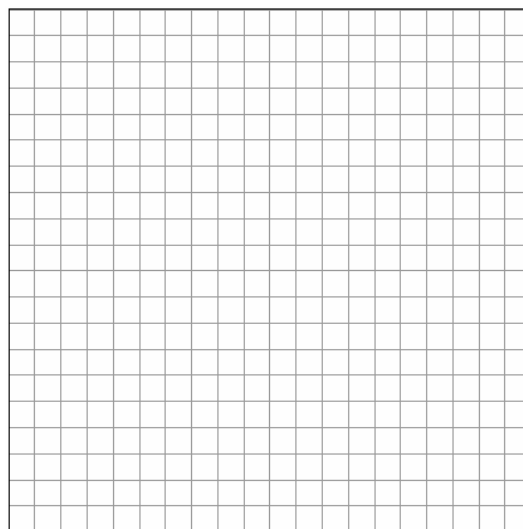
Greg is in a car at the top of a roller-coaster ride. The distance, d , of the car from the ground as the car descends is determined by the equation $d = 144 - 16t^2$, where t is the number of seconds it takes the car to travel down to each point on the ride. How many seconds will it take Greg to reach the ground?



2. 010431b, P.I. A2.A.7

An acorn falls from the branch of a tree to the ground 25 feet below. The distance, S , the acorn is from the ground as it falls is represented by the equation

$S(t) = -16t^2 + 25$, where t represents time, in seconds. Sketch a graph of this situation on the accompanying grid. Calculate, to the *nearest hundredth of a second*, the time the acorn will take to reach the ground.



Part 2: Solving Quadratic Equations Using Square Roots

3. 010215a, P.I. A.A.27

What is the solution set of the equation

$$3x^2 = 48?$$

[A] $\{4,4\}$

[B] $\{4,-4\}$

[C] $\{2,8\}$

[D] $\{-2,-8\}$

5. 080733a, P.I. A.A.27

What is the positive solution of the equation

$$4x^2 - 36 = 0?$$

4. 010808a, P.I. A.A.27

A solution of the equation $\frac{x^2}{4} = 9$ is

[A] 3

[B] 6

[C] $\frac{3}{2}$

[D] 12

- [4] 3, and an appropriate algebraic or graphic solution is shown.
- [3] The equation is graphed correctly, but the time to reach the ground is not identified.
- or [3] Appropriate work is shown for an algebraic solution, but either no solution is found or the negative root is not rejected.
- or [3] An appropriate algebraic solution is shown, but one computational error is made.
- [2] The equation is graphed incorrectly, but an appropriate time to reach the ground is identified.
- or [2] The equation is factored incorrectly, but an appropriate solution is found.
- [1] 3, but no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
-

- [4] A correct graph is sketched and 1.25, and appropriate work is shown.
- [3] A correct graph is sketched, but one computational or rounding error is made in determining the time.
- or [3] Appropriate work is shown, but one error is made in sketching the graph, such as the axes are not labeled or are labeled incorrectly, but the time is determined correctly.
- or [3] A correct graph is sketched and appropriate work is shown to calculate the time, but the negative root is not rejected.
- [2] Appropriate work is shown, but two or more computational, rounding, or graphing errors are made.
- or [2] Appropriate work is shown, but one conceptual error is made.
- or [2] A correct graph is sketched, but no further correct work is shown.
- or [2] Appropriate work is shown to calculate the time, but no graph or an incorrect graph is sketched.
- [1] Appropriate work is shown to calculate the time, but one computational or rounding error is made, and no graph or an incorrect graph is sketched.
- or [1] Appropriate work is shown to calculate the time, but the negative root is not rejected, and no graph or an incorrect graph is sketched.
- or [1] 1.25, but no graph or an incorrect graph is sketched, and no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
-
- [3] B
- [4] B

[2] 3, and appropriate work is shown, such as factoring or trial and error with at least three trials and appropriate checks.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made, such as not rejecting the negative root.

or [1] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.

or [1] 3, but no work or fewer than three trials and appropriate checks are shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[5] incorrect procedure.