

Quadratic Jeopardy

Algebra I	Algebra II	Graphs	Word Probs	Inequalities
<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
<u>30</u>	<u>30</u>	<u>30</u>	<u>30</u>	<u>30</u>
<u>40</u>	<u>40</u>	<u>40</u>	<u>40</u>	<u>40</u>
<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>



Solve using Factoring

$$24. 2(2u^2 - 4u) + 3 = 0$$



Solve by Completing the Square

$$43. x^2 - \frac{1}{2}x - \frac{3}{16} = 0$$



Solve by quadratic formula (3sf):

$$78. \pi x^2 - 15\sqrt{2}x + 20 = 0$$



Solve algebraically

$$27. \frac{4(x-2)}{x-3} + \frac{3}{x} = \frac{-3}{x(x-3)}$$



Determine the value(s) of b such that $f(x) = 2(\pi x)^2 + b\pi x + \sqrt{8}$ has 2 solutions.



Write an equation with rational coefficients having $2 - 4\sqrt{3}$ as one of its roots.



If $y = -4kx^2 + kx - 1$, determine the value(s) of k for which the minimum value of the function is an integer.



The parabola $y = ax^2 + bx + 1$ passes through the point $(1, 2)$. For what values of a does the parabola intersect the x-axis at two distinct points?



Solve the following system
for m such that there exists
only one unique solution

$$\begin{cases} y = x^2 + 4x + 6 \\ y = mx + 5 \end{cases}$$

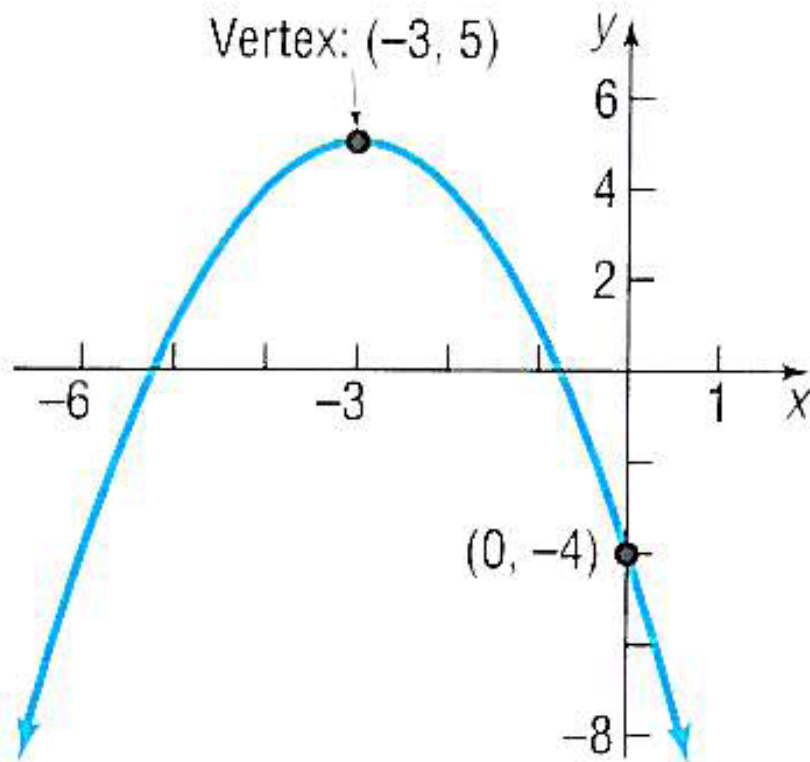


The nonzero roots of the equation $3x^2 - 4x + k = 0$ are in the ratio 3:1. Determine the roots and the value of k .



Determine the equation in standard form:

55.



Determine the transformations of the parent/base function $y = x^2$ if the equation of the transformed function is now $y = \frac{1}{3}x^2 + 4x - K$



Given the quadratic function
 $f(x) = -2x^2 + 5x - 3$,
determine the:

- (a) domain and range,
- (b) vertex & the max/min
point & value,
- (c) the x-intercepts of $f(x)$
- (d) Sketch



Determine and classify the extrema
of $f(x) = -2x^2 + 6x - 3$ on the domain
of $x \in [-5, 6]$



Determine the minimum value of the function defined by $f(x) = a(x - 2)(x - R)$, where $a > 0$



Physics A ball is thrown vertically upward from the top of a building 96 feet tall with an initial velocity of 80 feet per second. The distance s (in feet) of the ball from the ground after t seconds is $s = 96 + 80t - 16t^2$.

- (a) After how many seconds does the ball strike the ground?
- (b) After how many seconds will the ball pass the top of the building on its way down?



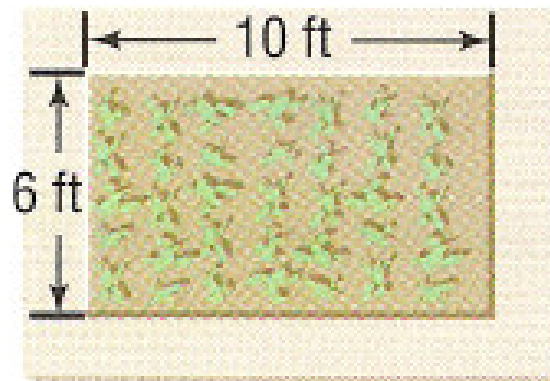
Dimensions of a Window The area of the opening of a rectangular window is to be 143 square feet. If the length is to be 2 feet more than the width, what are the dimensions?



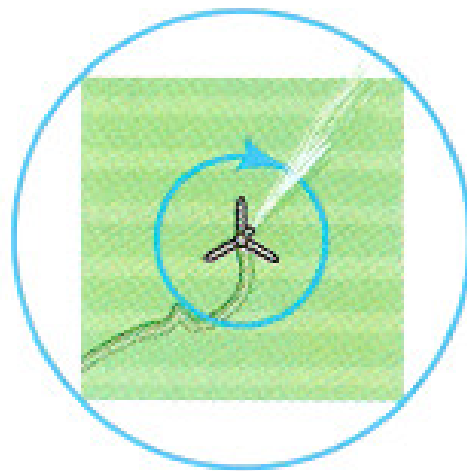
Constructing a Box An open box is to be constructed from a square piece of sheet metal by removing a square of side 1 foot from each corner and turning up the edges. If the box is to hold 4 cubic feet, what should be the dimensions of the sheet metal?



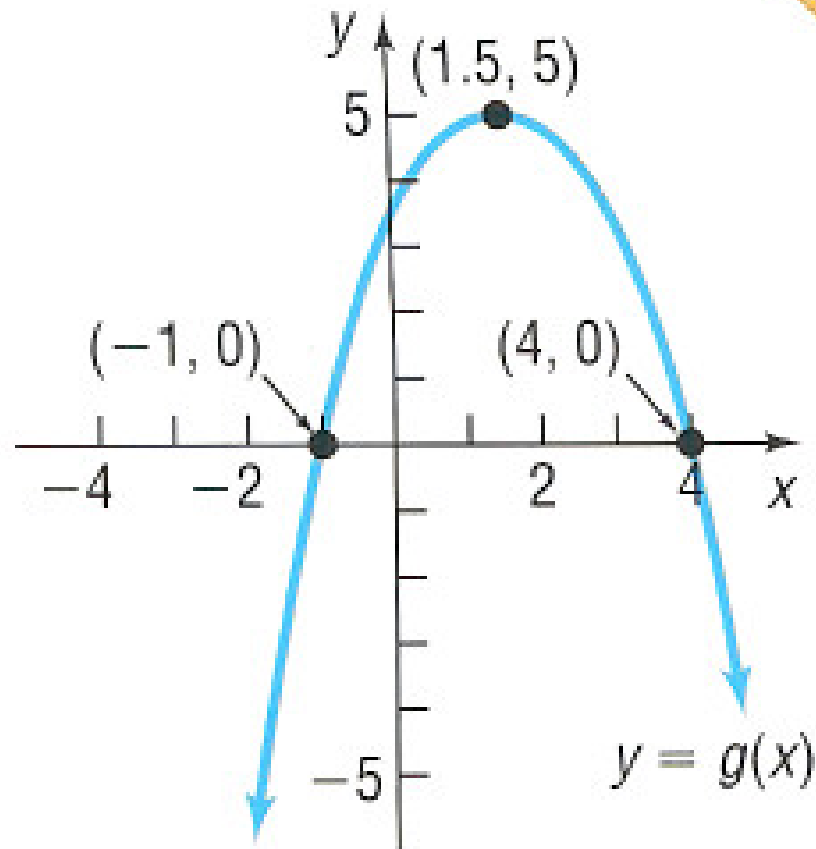
Constructing a Border around a Garden A landscaper, who just completed a rectangular flower garden measuring 6 feet by 10 feet, orders 1 cubic yard of premixed cement, all of which is to be used to create a border of uniform width around the garden. If the border is to have a depth of 3 inches, how wide will the border be? (1 cubic yard = 27 cubic feet)



Watering a Field An adjustable water sprinkler that sprays water in a circular pattern is placed at the center of a square field whose area is 1250 square feet (see the figure). What is the shortest radius setting that can be used if the field is to be completely enclosed within the circle?



4.

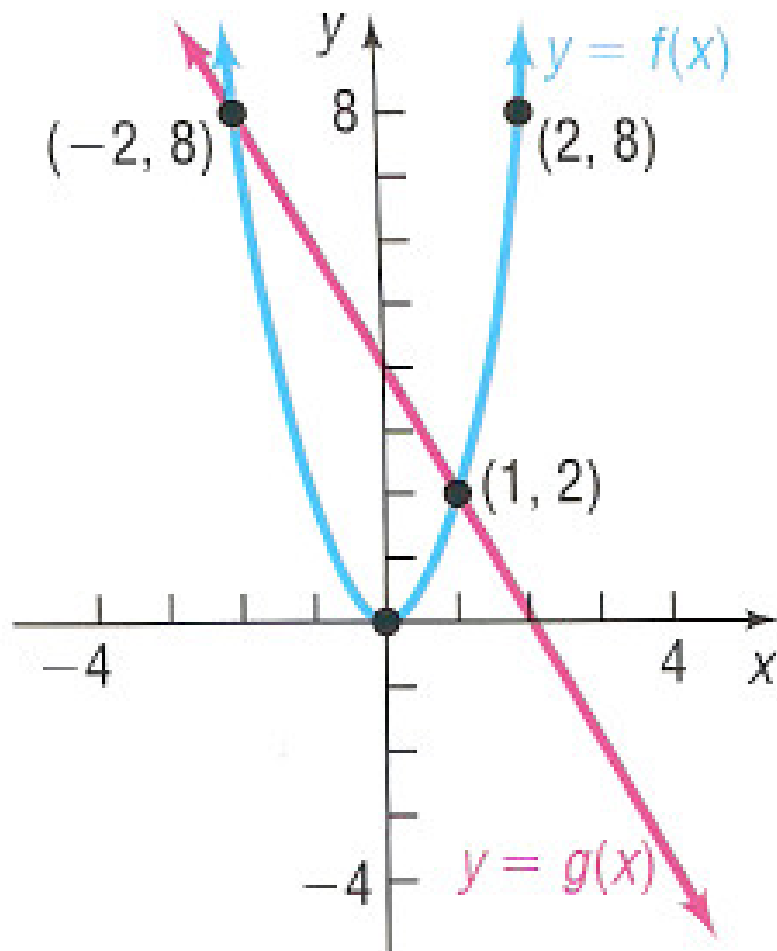


(a) $g(x) < 0$

(b) $g(x) \geq 0$



5.



(a) $g(x) \geq f(x)$

(b) $f(x) > g(x)$



$$21. 6(x^2 - 1) > 5x$$



Solve $2(2x^2 - 3x) < 9$



Artillery A projectile fired from the point $(0,0)$ at an angle to the positive x -axis has a trajectory given by

$$y = cx - (1 + c^2) \left(\frac{g}{2} \right) \left(\frac{x}{v} \right)^2$$

where

x = horizontal distance in meters

y = height in meters

v = initial muzzle velocity in meters per second (m/sec)

g = acceleration due to gravity = 9.81 meters per second squared (m/sec^2)

$c > 0$ is a constant determined by the angle of elevation.

A howitzer fires an artillery round with a muzzle velocity of 897 m/sec.

- (a) If the round must clear a hill 200 meters high at a distance of 2000 meters in front of the howitzer, what c values are permitted in the trajectory equation?
- (b) If the goal in part (a) is to hit a target on the ground 75 kilometers away, is it possible to do so? If so, for what values of c ? If not, what is the maximum distance the round will travel?

