

Unit 1/2 Remediation

Skill Set	In Class Example	You Try
Factor Completely Solve by Square Root	Factor completely: $2x^3 + 4x^2 - 6x$ $2x(x^2 + 2x - 3)$ $2x(x+3)(x-1)$	Factor completely: $6x^4 - 27x^3 - 15x^2$ $3x^2(2x^2 - 9x - 5)$ $3x^2(2x+1)(x-5)$
	Solve: $x^2 + 2 = 6$ $\sqrt{x^2} = \sqrt{4}$ $x = \pm 2$	Solve: $5x^2 - 28 = 27$ $5x^2 = 55$ $\sqrt{x^2} = \sqrt{11}$ $x = \pm \sqrt{11}$
Transformations Switch Forms of a Quadratic Rate of Change	The parent function $f(x) = x^2$ is reflected across the x-axis, vertically stretched by a factor of 4 and translated right 3 units to create $g(x)$. Use the description to write the quadratic function in vertex form. $f(x) = -4(x-3)$	Starting with a parent function of $f(x) = x^2$, describe the transformations need to graph the function $g(x) = -\frac{1}{2}(x+6)^2 + 8$? - Reflect across x-axis - V shrink of $\frac{1}{2}$ - Left 6 - Up 8
	Convert $x^2 + 6x + 11$ to vertex form. $h = \frac{-b}{2a} = \frac{-6}{2(1)} = \frac{-6}{2} = -3$ $k = f(-3) = (-3)^2 + 6(-3) + 11 = 2$ $f(x) = (x+3)^2 + 2$	If the equation $x^2 - 12x - 9 = 0$ is converted to the form $(x-b)^2 + C$ by completing the square, write the resulting equation. $x^2 - 12x + 36 = 9 + 36 + 36$ $(x-6)^2 = 45$ $(x-6)^2 - 45 = 0$
	Calculate the average rate of change of $f(x) = 4x^2 + 3x + 5$ on the interval $[2, 5]$. $f(2) = 4(2)^2 + 3(2) + 5 = 27$ $f(5) = 4(5)^2 + 3(5) + 5 = 120$ $\frac{120-27}{5-2} = \frac{93}{3} = 31$	For the function $f(x) = -2x^2 + 12x - 10$ find the rate of change from $[-1, 3]$. $f(-1) = -2(-1)^2 + 12(-1) - 10 = -24$ $f(3) = -2(3)^2 + 12(3) - 10 = 8$ $\frac{8-(-24)}{3-(-1)} = \frac{32}{4} = 8$

A softball is thrown into the air with an initial velocity of 5 meters per second from a height of 9 meters. The equation $h(t) = -4.9t^2 + 5t + 9$ models the distance of the softball from the ground in meters after t seconds. How many seconds does it take for the softball to hit the ground?

$a = 4.9$
 $b = -5$
 $c = -9$

$$0 = -4.9t^2 + 5t + 9 = 0$$

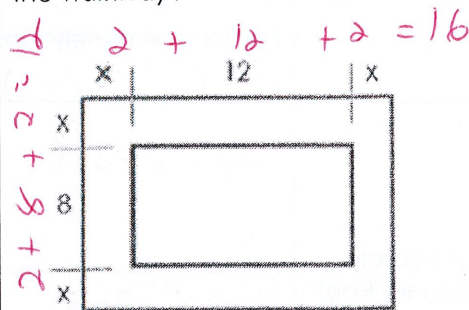
$$4.9t^2 - 5t - 9 = 0$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(4.9)(-9)}}{2(4.9)}$$

$$x = \frac{5 \pm \sqrt{201.4}}{9.8}$$

$x = 1.96$ ~~9.4~~
 Seconds

A garden measuring 8 feet by 12 feet has a walkway around it. The walkway has a uniform width, and the area covered by the garden and walkway is 192 square feet. What is the width (x) of the walkway?



$$(2x + 12)(2x + 8) = 192 \quad (x+12)(x+8) = 0$$

$$4x^2 + 16x + 24x + 96 = 192 \quad x = \cancel{12}, 2$$

$$4x^2 + 40x + 96 = 192$$

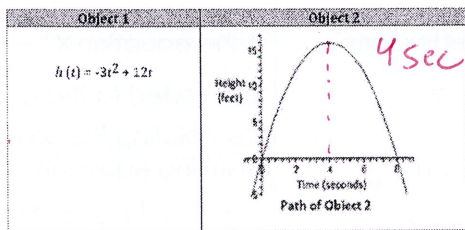
$$4x^2 + 40x - 96 = 0$$

$$x^2 + 10x - 24 = 0$$

16ft x 12ft

Applications
Comparing

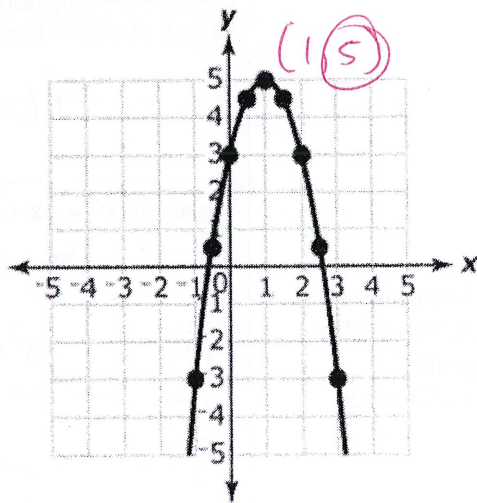
Two objects are launched from ground level at the same time. The height of Object 1 is represented by $h(t) = -3t^2 + 12t$. The graph shows the path of Object 2. Which object will reach maximum height first?



$$h = \frac{-b}{2a} = \frac{-12}{2(-3)} = \frac{-12}{-6} = 2$$

Object 1 at
2 seconds

Which equation has a greater maximum value than the function in the graph?



- a) $f(x) = -3(x+1)^2 + 3$
- b) $f(x) = -2(x-1)^2 + 4$
- c) $f(x) = -4(x-6)^2 + 5$
- d) $f(x) = -5(x-3)^2 + 7$