

1. When a pumpkin chunker launches a pumpkin, the goal is long distance, not height. Suppose the pumpkin is launched 20 feet above the ground at a velocity of 50 feet per second. Round to the nearest hundredth.
- a. Write a rule that shows how the pumpkin's height is changing as a function of time.

$$h = 20 + 50t - 16t^2$$

- b. What will the height be at 2 seconds? Show your work.

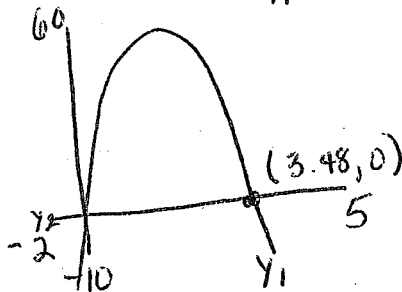
x	y = 20 + 50t - 16t ²
1	54
2	56
3	26

56 ft

- c. How long will the pumpkin be in the air? Write and solve an equation or inequality. Show all work.

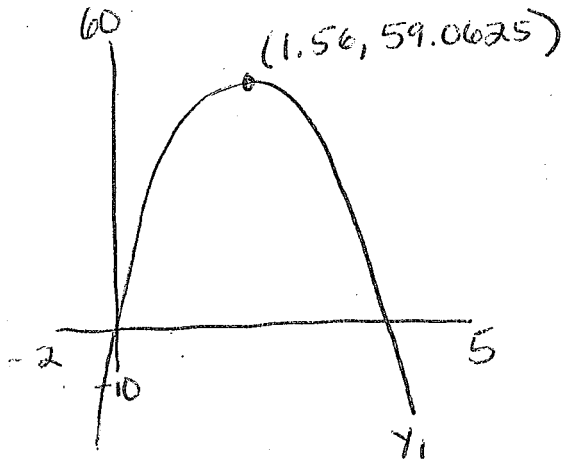
$$0 = 20 + 50t - 16t^2$$

y_2 y_1



3.48 sec

- d. When will the pumpkin reach its maximum height, and what will that height be? Show all work.

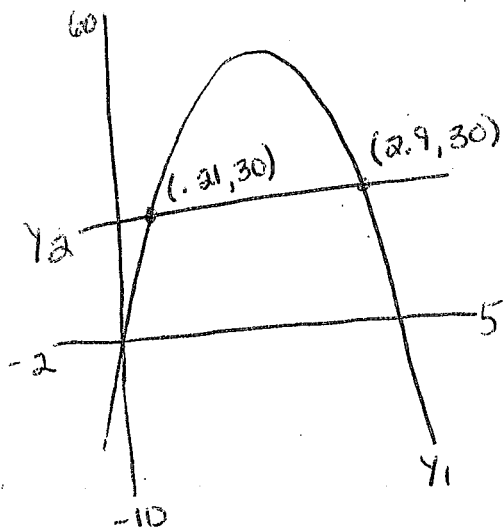


<p>1.56 sec 59.0625 ft</p>

- e. When will the height of the pumpkin be at least 30 feet above the ground? Show all work.

$$20 + 50t - 16t^2 \geq 30$$

t_1 t_2



$$.21 \leq x \leq 2.9$$

2. Use what you know about the connections between rules and graphs for quadratic functions to match the given functions with their graphs that appear below. Each graph is shown in the standard viewing window. Explain your choice in each case.

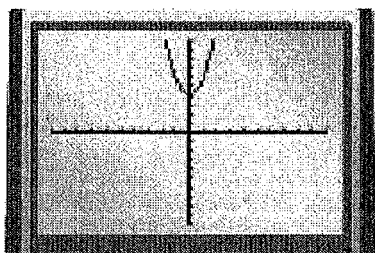
Rule I $y = x^2 - 4$

Rule II $y = 2x^2 + 4$

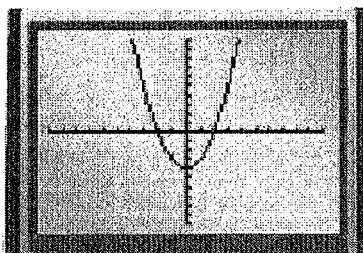
Rule III $y = -x^2 + 2x + 4$

Rule IV $y = -0.5x^2 + 4$

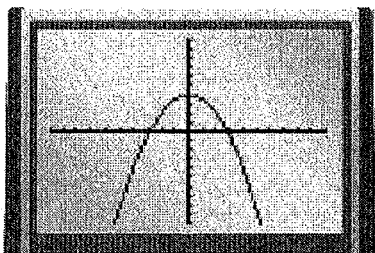
A



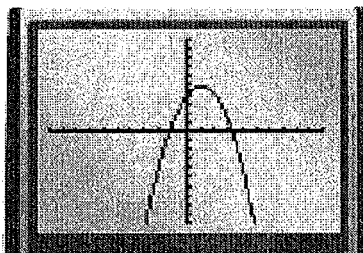
B



C



D



Rule	Graph	Explanation
I	B	a is positive, so it opens up c is negative, so it crosses y-axis at -4 b is 0, so it is symmetric to y-axis
II	A	a is positive, so it opens up a > 1, so it is narrower c is positive, so y-int is 4 b is 0, so it is symmetric to y-axis
III	D	a is negative, so it opens down c is positive, so yint is 4 b is 2 so it is not symmetric to y-axis since a and b are opposite, it moves right
IV	C	a is negative, so it opens down -1 < a < 0, so it is wider c is yint at 4 b is 0, so it is symmetric to y-axis