

Warm up

The graph $f(x) = 0.5(x - 5)^2 + 3$ is shown below. Complete the information.

$$y = \frac{1}{2}(x - 5)^2 + 3$$

vertex: $(5, 3)$

axis of symmetry: $x = 5$

direction of opening: up

max or min value: 3

domain: $\{x \mid x \in \mathbb{R}\}$

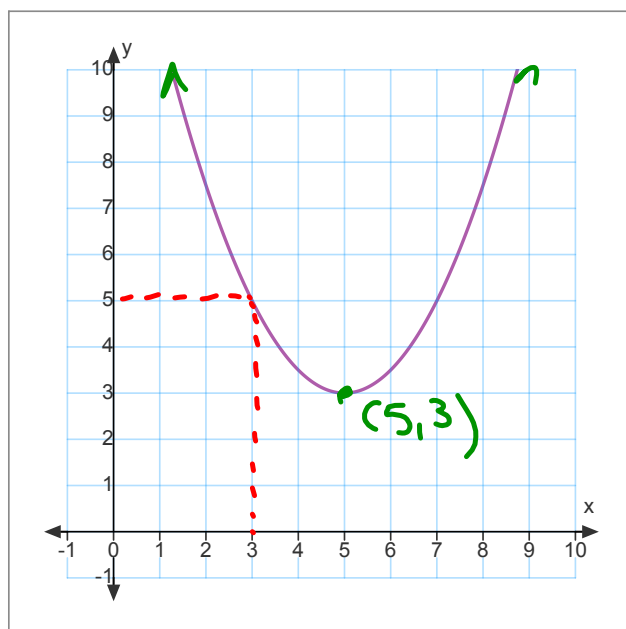
range: $\{y \mid y \in \mathbb{R}, y \geq 3\}$

x-intercept(s): None

y-intercept: 7.5

state $f(3)$: = 5

↑ what is y , when $x=3$



MCF 3MI

Unit 4 - Standard and Vertex Form

Day 1 - Vertex Form of a Quadratic Equation - Day 1

Vertex Form

$$y = a(x - h)^2 + k$$

↑ stretch

→ the vertex is (h, k)

opp sign

Standard Form

$$y = ax^2 + bx + c$$

Example 1:



For each function, state

• vertex

• axis of symmetry

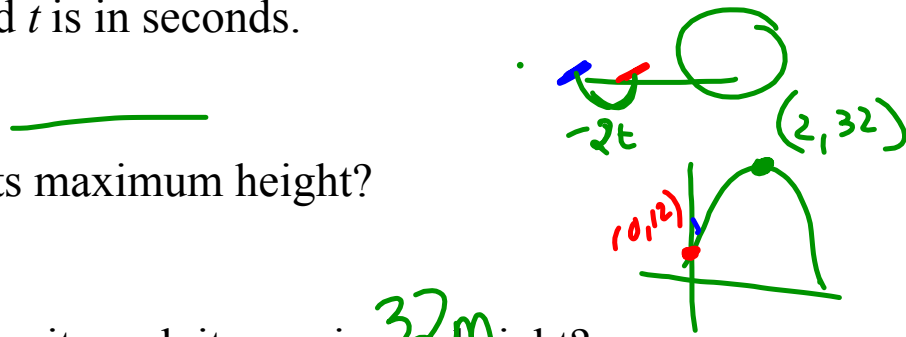
• direction of opening

• max/min value

• domain & range

	$f(x) = (x - 2)^2 - 4$	$g(x) = -3(x + 1)^2 + 5$
• vertex	$(2, -4)$	$(-1, 5)$
• axis of symmetry	$x = 2$	$x = -1$
• direction of opening	up	down
• max/min value	min: -4	max: 5
• domain & range	$D: \{x \mid x \in \mathbb{R}\}$ $R: \{y \mid y \in \mathbb{R}, y \geq -4\}$	$D: \{x \mid x \in \mathbb{R}\}$ $R: \{y \mid y \in \mathbb{R}, y \leq 5\}$

A water balloon is thrown from the balcony of an apartment building, following a path defined by $h(t) = -5(t - 2)^2 + 32$, where h is in meters and t is in seconds.



a) What is its maximum height?

b) When does it reach its maximum height? 32m

c) Write the equation in standard form. t = 2 seconds

$$(t-2)(t-2) = t^2 - 2t - 2t + 4$$

$$h(t) = -5(t^2 - 4t + 4) + 32$$

$$= -5t^2 + 20t - 20 + 32$$

$$= -5t^2 + 20t + 12$$

↑ junk

d) What height was it thrown from?

↳ t = 0 ∴ it was thrown from a height of 12m

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