LESSON MAKER PRO

Graph the Story

Sketch functions and read their key features.

HIGH SCHOOL · PC.F.1.2

PC.F.1.2 "Sketch the graph of a function that models a relationship between two quantities, identifying key features."

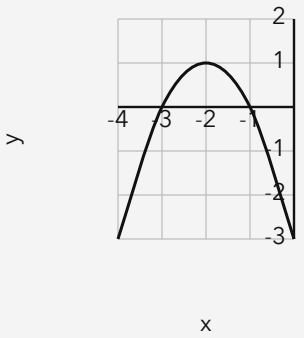
NAME _____ DATE _____

FIND THE FEATURES

Use a function's rule or graph to locate points that guide your sketch. An x-intercept has y = 0, a y-intercept has x = 0, and a parabola's vertex is its turning point.

WORKED EXAMPLE

Find the vertex and x-intercepts of the graphed function.



1. Locate the turning point: (-2, 1).
2. Read where the curve crosses the x-axis: (-3, 0) and (-1, 0).

Answer: Vertex: (-2, 1). X-intercepts: (-3, 0) and (-1, 0).

PRACTICE 4 problems

1 Sketch $y = (x - 2)^2 - 1$. Label its vertex.

ANSWER _____

2 Sketch $y = -(x + 1)^2 + 4$. Label both x-intercepts.

ANSWER _____

3 Sketch $y = 2x - 6$. Label both intercepts.

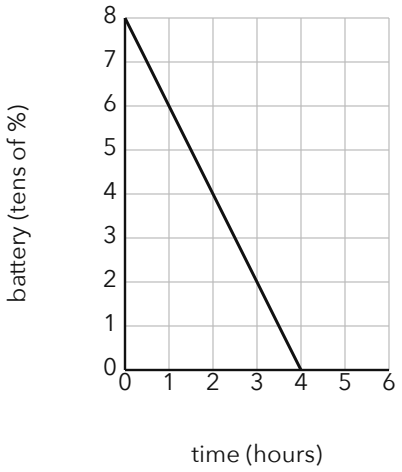
ANSWER _____

4 Sketch $y = -x + 5$. Label its y-intercept.

ANSWER _____

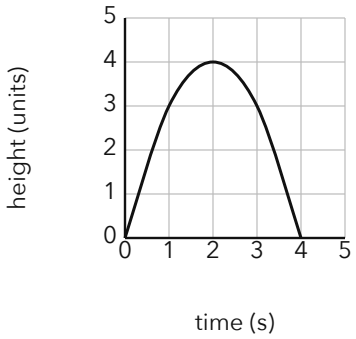
APPLY IT Show your work

1 The graph tracks your phone's battery. After hour 4, you plug it in. Extend the graph with a straight line to 60% at hour 6. When is the battery lowest?



ANSWER _____

2 The graph shows a video-game character's jump. Sketch the same jump starting 1 second later. Give the new peak time and landing time.



ANSWER _____

CHALLENGE One step up

A pop-up store models profit y, in hundreds of dollars, after x hours by $y = -(x - 3)^2 + 4$, for $0 \le x \le 5$. Sketch the graph. Give the maximum profit and every break-even time in the domain.

WORK SPACE AND ANSWER

Graph the Story

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Sketch $y = (x - 2)^2 - 1$. Label its vertex.	**Upward-opening parabola with vertex (2, -1); it passes through (1, 0) and (3, 0).**
2	Sketch $y = -(x + 1)^2 + 4$. Label both x-intercepts.	**Downward-opening parabola with x-intercepts (-3, 0) and (1, 0) and vertex (-1, 4).**
3	Sketch $y = 2x - 6$. Label both intercepts.	**Line through the x-intercept (3, 0) and y-intercept (0, -6).**
4	Sketch $y = -x + 5$. Label its y-intercept.	**Decreasing line through (0, 5) and (5, 0); y-intercept (0, 5).**

PART 2 · APPLY IT

1. **Draw a straight segment from (4, 0) to (6, 6). The battery is lowest at hour 4, at 0%.** The vertical axis counts tens of percent, so 60% is 6. The graph reaches its lowest point at (4, 0).
2. **Draw the same curve through (1, 0), (2, 3), (3, 4), (4, 3), and (5, 0). Peak: 3 seconds. Landing: 5 seconds.** Move every point 1 second to the right without changing its height. The new vertex is (3, 4), and the new landing point is (5, 0).

CHALLENGE

Sketch the downward-opening parabola from (0, -5) through (1, 0), (2, 3), (3, 4), (4, 3), and (5, 0). Maximum profit: $400 at hour 3. Break-even times: hours 1 and 5.

Accept sketches with the correct shape, labeled features, and appropriate plotted points. For the challenge, accept a maximum of 4 hundreds of dollars.