LESSON MAKER PRO

Graph Feature Hunt

Read key features from functions, graphs, and patterns.

HIGH SCHOOL · HSF-IF.B.4

CCSS.Math.Content.HSF-IF.B.4 "For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship..."

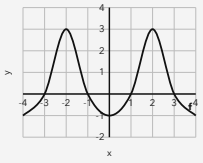
NAME _____ DATE _____

READ THE STORY

An x-intercept is where a graph meets the x-axis, so the output is zero. Track a graph from left to right to find where outputs rise or fall. A repeating graph has the same pattern after one period.

WORKED EXAMPLE

Use the graph. State the y-intercept and all relative maxima.



1. Find where the graph crosses the y-axis.
2. The crossing is at (0, -1).
3. Find each peak higher than nearby points.
4. The peaks are at (-2, 3) and (2, 3).

Answer: y-intercept: (0, -1); relative maxima: (-2, 3) and (2, 3)

PRACTICE 4 problems

1 A graph crosses the x-axis at x = -9, x = 11, and x = 17. It is below the x-axis when x < -9. On what intervals is f positive?

ANSWER _____

2 A graph decreases directly from its relative maximum at (10, 15) to its next relative minimum at (14, 6). On what interval is it decreasing?

ANSWER _____

3 For y = 25 - |x - 12|, give the relative maximum and the y-intercept.

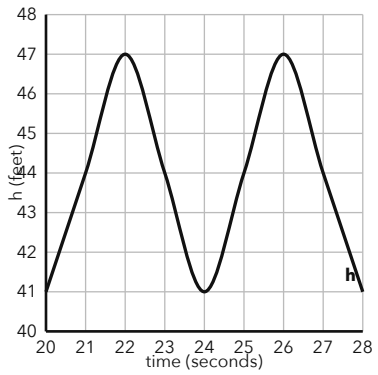
ANSWER _____

4 A function satisfies f(-x) = f(x). Name its symmetry. If f(x) approaches 30 as x increases without bound, what happens as x decreases without bound?

ANSWER _____

APPLY IT Show your work

1 The graph shows a drone club's flight height h, in feet, during a short test. During which intervals shown is h increasing, and what is the maximum height?



ANSWER _____

2 The concert light is at peak brightness at the time shown. It returns to peak brightness every 17 minutes. List the next three peak times.



ANSWER _____

CHALLENGE One step up

Use the marked timeline. A game battery level is 50% at 30 minutes, falls steadily to 35% at 36 minutes, then rises steadily to 50% at 42 minutes. This pattern repeats. Explain why the battery level is not increasing for the whole shown interval, and state the period.



WORK SPACE AND ANSWER

ANSWER KEY

Graph Feature Hunt

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A graph crosses the x-axis at x = -9, x = 11, and x = 17. It is below the x-axis when x < -9. On what intervals is f positive?	**(-9, 11) and (17, infinity)**
2	A graph decreases directly from its relative maximum at (10, 15) to its next relative minimum at (14, 6). On what interval is it decreasing?	**(10, 14)**
3	For y = 25 - |x - 12|, give the relative maximum and the y-intercept.	**relative maximum: (12, 25); y-intercept: (0, 13)**
4	A function satisfies f(-x) = f(x). Name its symmetry. If f(x) approaches 30 as x increases without bound, what happens as x decreases without bound?	**y-axis symmetry; f(x) approaches 30 as x decreases without bound**

PART 2 · APPLY IT

1. **h is increasing on (20, 22) and (24, 26); maximum height: 47 feet** Read the rising portions from left to right. The highest plotted height is 47 feet.
2. **6:17, 6:34, 6:51** Add 17 minutes repeatedly to the shown peak time.

CHALLENGE

It decreases from 30 to 36 minutes, so it is not increasing for the whole interval. The period is 12 minutes.

Accept equivalent interval notation and wording such as "increases between 20 and 22." For relative extrema, require both coordinates when coordinates are requested.