

Algebra 1 11/7

Warm Up IXL

Algebra 1

B.6

1-8 Interpreting Graphs of Functions

I can interpret the intercepts, extrema, and end behavior of graphs

intercepts

the points where the graph intersects an axis

y-intercept

the point where the graph intersects the y-axis

x-intercept

the point where the graph intersects the x-axis

Linear Function

a function whose graph is a straight line

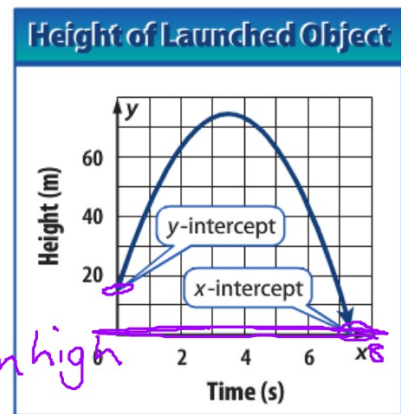
Nonlinear Function

a function whose graph is a smooth curve (not a line)

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Ex. 1

- A. **PHYSICS** The graph shows the height y of an object as a function of time x . Identify the function as *linear* or *nonlinear*. Then estimate and interpret the intercepts.

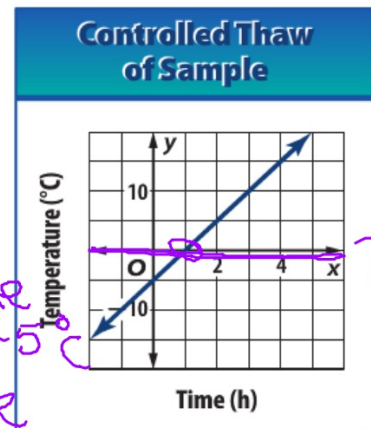


nonlinear

y-int $\approx 18\text{m}$ at zero second the object is 18m high

x-int $\approx 7.3\text{sec}$ after 7.3 sec the object has 0 height

- B. The graph shows the temperature y of a medical sample thawed at a controlled rate. Identify the function as *linear* or *nonlinear*. Then estimate and interpret the intercepts.



linear

y-inter $\approx -5^\circ\text{C}$ at zero time the temp is -5°C

x-inter $\approx 1\text{hr}$ after 1hr the temp is 0°C

$T=0^\circ$

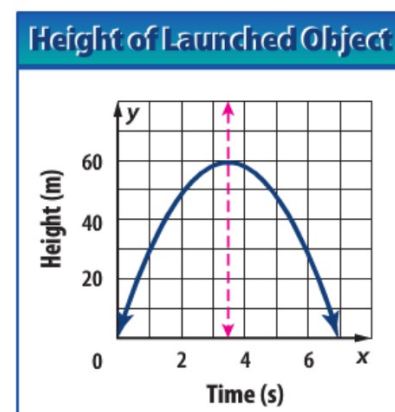
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Line of symmetry

some functions are symmetric about a vertical line, the graph is a mirror image across this line

Ex. 2 **PHYSICS** An object is launched. The graph shows the height y of the object as a function of time x . Describe and interpret any symmetry.

The symmetry shows that the time it took for the object to go up to its maximum height is equal to the time it takes it to come back down



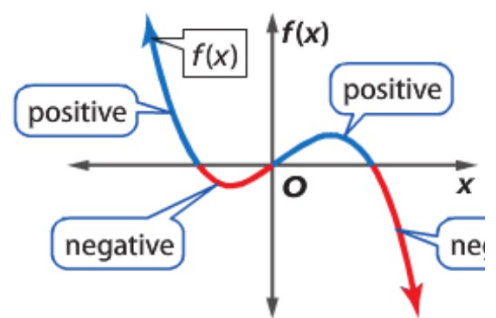
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Positive

where the graph lies above the x-axis

Negative

where the graph lies below the x-axis

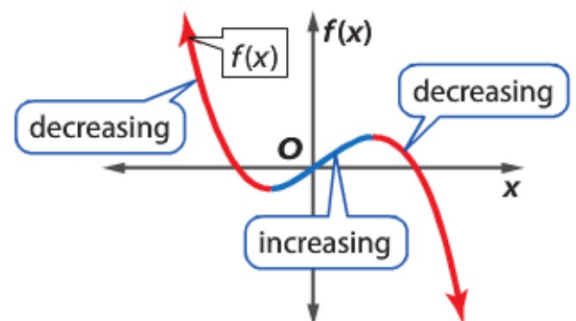


Increasing

where the graph goes up when viewed from left to right

Decreasing

where the graph goes down when viewed from left to right



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Extrema

the location of relatively high or low places on the graph (the turning points)

Relative Minimum

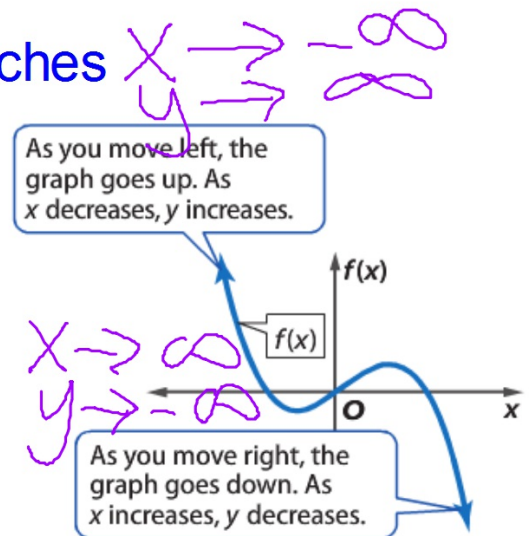
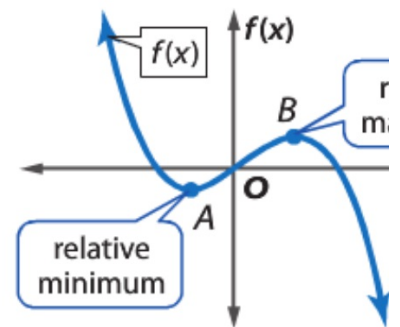
the low point where the graph switches from decreasing to increasing

Relative Maximum

the high point where the graph switches from increasing to decreasing

End Behavior

describes the values of the function at the positive and negative extremes in the domain (the x)



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Ex. 3

VIDEO GAMES U.S. retail sales of video games from 2000 to 2009 can be modeled by the function graphed at the right. Estimate and interpret where the function is positive, negative, increasing, and decreasing, the x-coordinates of any relative extrema, and the end behavior of the graph.



post. $(-0.7, 10.5)$
 neg $(-\infty, -0.7)$ and $(10.5, \infty)$
 increase $(-\infty, 1)$ and $(3, 8)$
 decrease $(1, 3)$ and $(8, \infty)$
 extrema $x=1$ max
 $x=3$ min $x=8$ max

End Beh
 $x \rightarrow -\infty$
 $y \rightarrow -\infty$
 $x \rightarrow \infty$
 $y \rightarrow -\infty$

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