Alg 1 1.8
Interpret intercepts and symmetry of graphs of functions.
Interpret positive/negative, increasing/decreasing, and end behavior.
Interpret vertices.

Real-World Example 1 Interpret Intercepts

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.

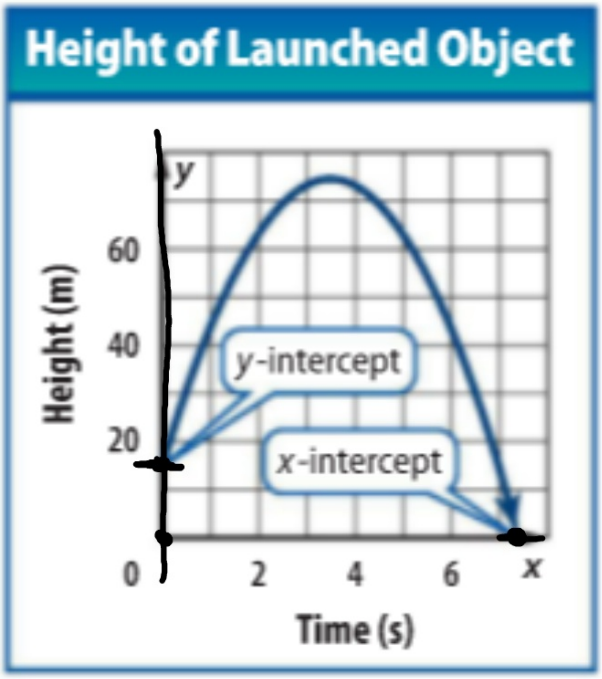
hit ground 7.5 sec.

Linear/nonlinear (7.5, 0)

x-intercept –

y-intercept – (0, 18)

launched 18 ft. high



1. 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.

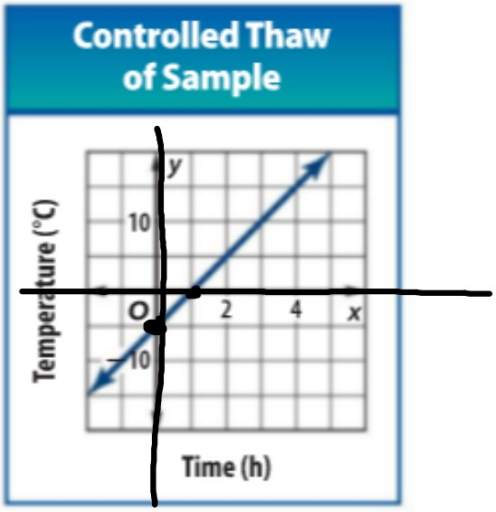
0°C after 1 hour

Linear/ nonlinear

x-intercept (1, 0)

y-intercept (0, −5)

Start at −5°C

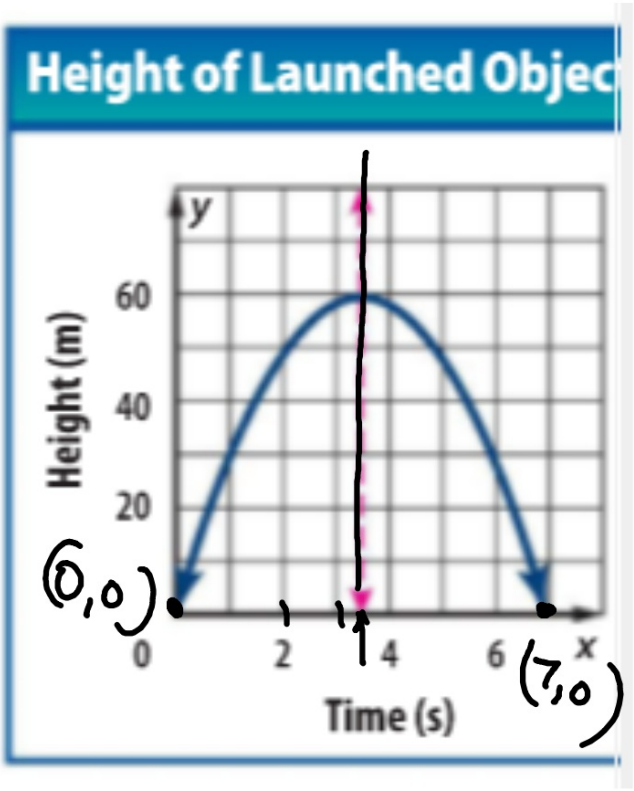


Real-World Example 2 Interpret Symmetry

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.

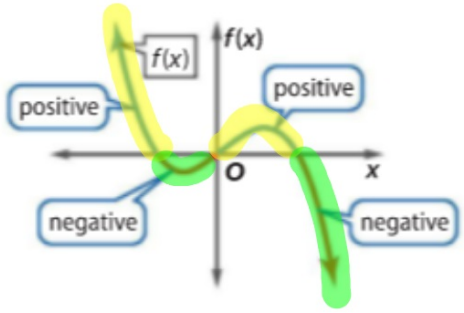
Vertical line of Symmetry at X=3.5

everything matches up

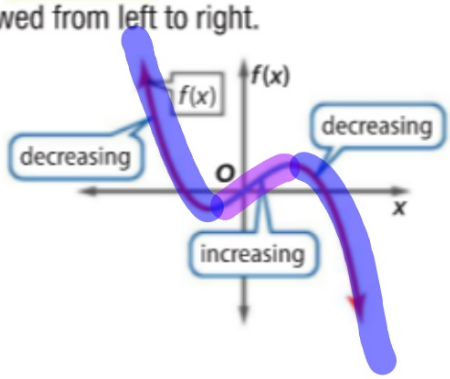


KeyConcepts Positive, Negative, Increasing, Decreasing, Extrema, and End Behavior

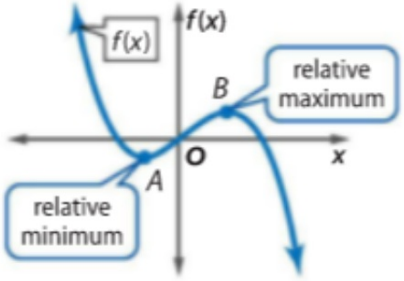
A function is **positive** where its graph lies *above* the x-axis, and **negative** where its graph lies *below* the x-axis.



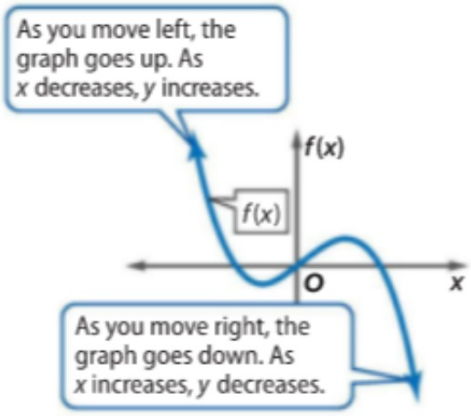
A function is **increasing** where the graph goes *up* and **decreasing** where the graph goes *down* when viewed from left to right.



The points shown are the locations of relatively high or low function values called **extrema**. Point *A* is a **relative minimum**, since no other nearby points have a lesser *y*-coordinate. Point *B* is a **relative maximum**, since no other nearby points have a greater *y*-coordinate.



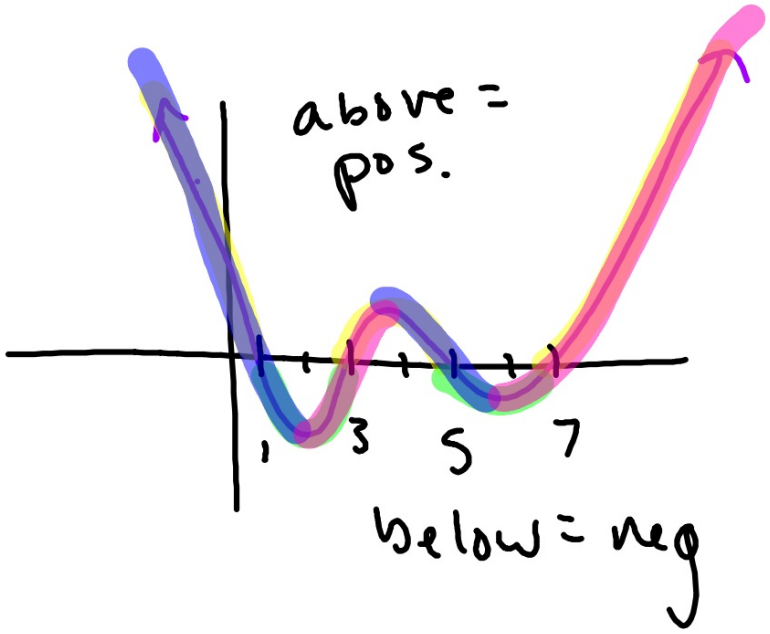
End behavior describes the values of a function at the positive and negative extremes in its domain.



Real-World Example 3 Interpret Extrema and End Behavior

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.

Positive
Negative
Increasing
Decreasing
extrema
end behavior


above = pos.
1
3
5
7
below = neg

Do:

increase/ decr.

pos. / neg

lin / non-linear

x+y intercept

not:

end behavior

vertex