Algebra 1 9.7

Identify and graph step functions

Identify and graph absolute value functions

Identify and graph piecewise functions

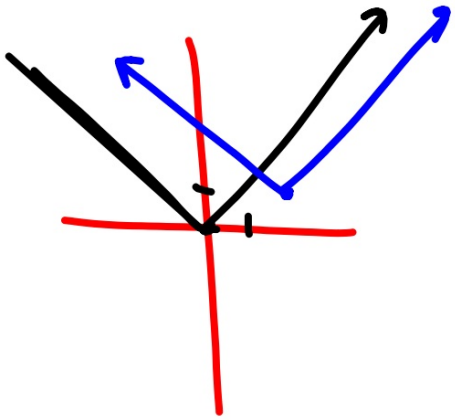
step function
(greatest integer function)

absolute value

piecewise

$y = |x|$

$y = |x-2| + 1$



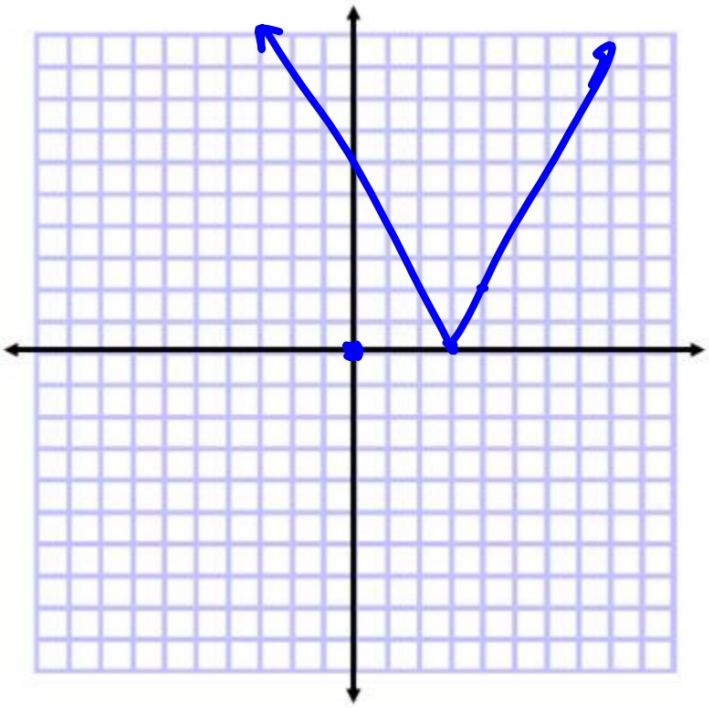
Parent graph... moves which way?

Example 3 Absolute Value Function

Graph $f(x) = |x - 4|$. State the domain and range.

$f(x) = |2x - 6|$

$|2(x - 3)|$



Colors

Example 4 Piecewise-Defined Function

Graph $f(x) = \begin{cases} -2x \text{ if } x > 1 \\ x + 3 \text{ if } x \leq 1 \end{cases}$. State the domain and range.

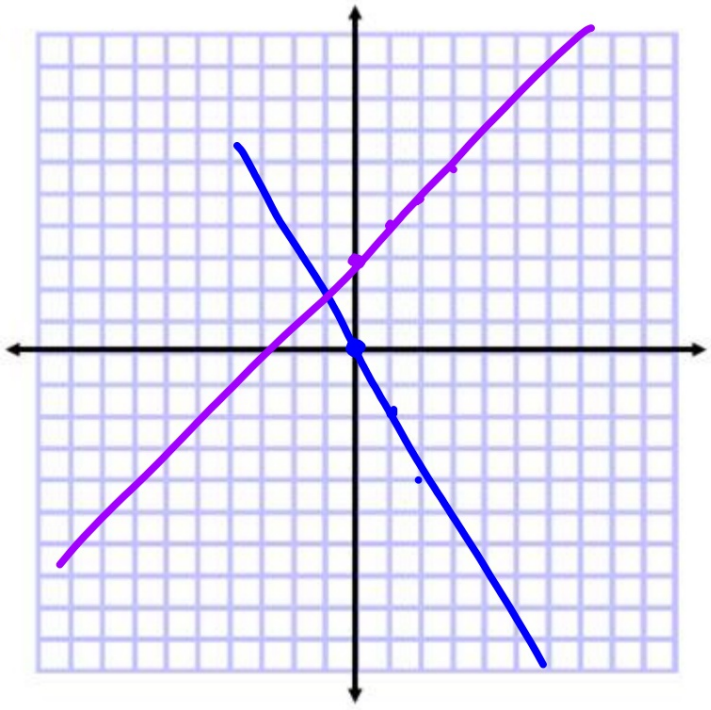
look here first

1. Note changeover
2. Graph
3. Keep/erase open solid
4. Answer D & R

$y = -2x$

$y = -2x + 0$

$y = x + 3$



Don't panic.
This is two equations. Each equation has its own region (domain) zone defense

1. Locate boundary
2. Graph the function
3. Keep what is in the correct region, erase the rest
4. Repeat

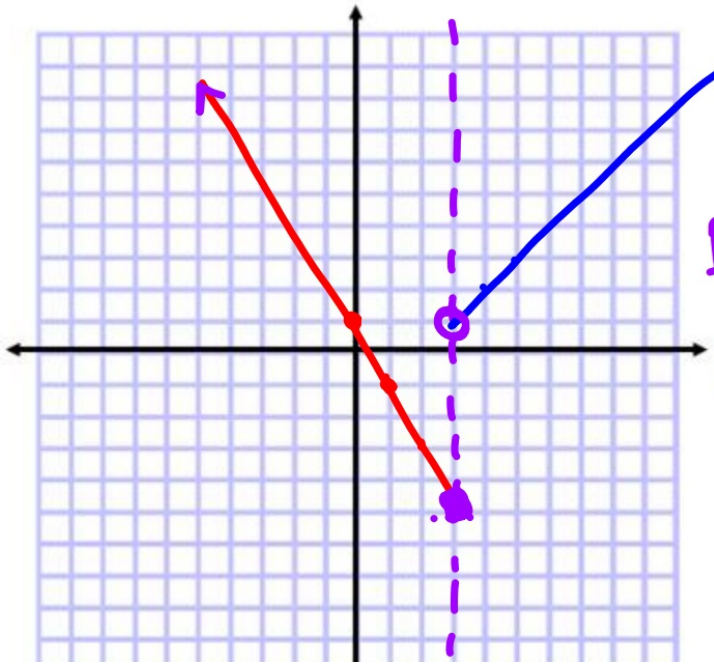
Dom. + Range

Example 4 Piecewise-Defined Function

Graph $f(x) = \begin{cases} x - 2 & \text{if } x > 3 \\ -2x + 1 & \text{if } x \leq 3 \end{cases}$. State the domain and range.

$y = x - 2$

$y = -\frac{2}{1}x + 1$



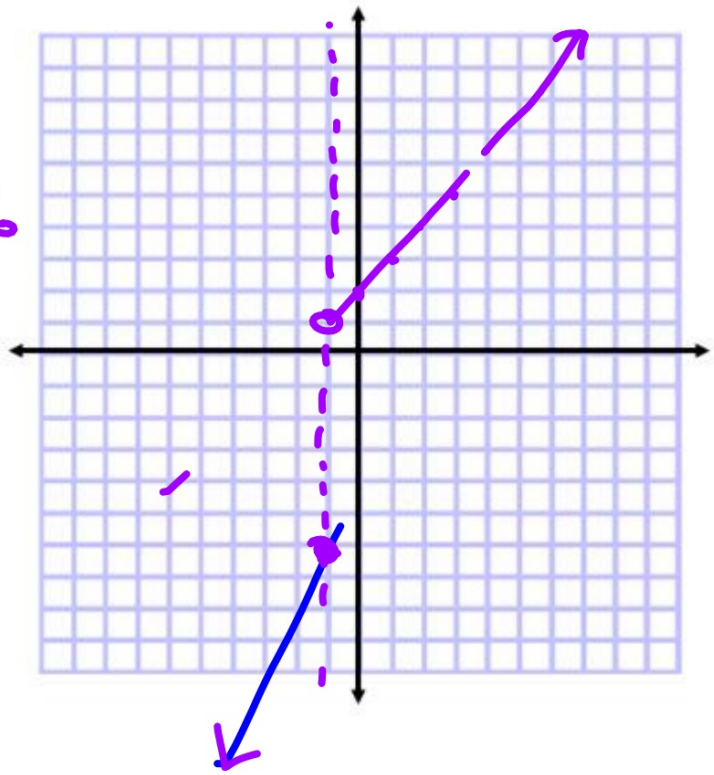
D: ARN

R: $y \geq -5$

Graph $f(x) = \begin{cases} x + 2 \text{ if } x > -1 \\ 3x - 5 \text{ if } x \leq -1 \end{cases}$

D: ARN

R $y > 1$ $y \leq -6$

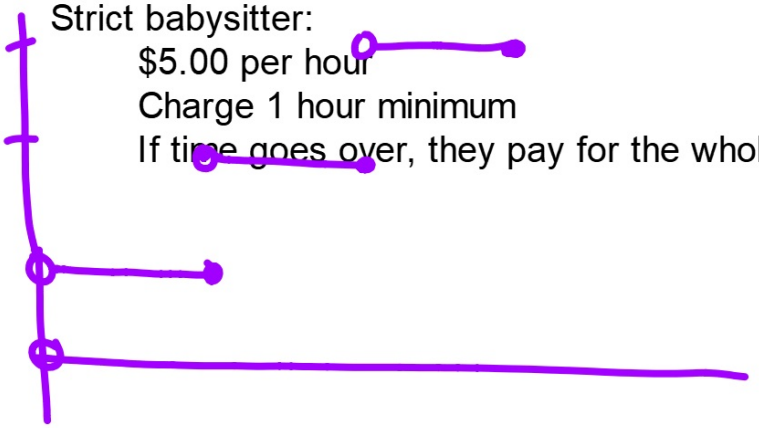


Strict babysitter:

$5.00 per hour

Charge 1 hour minimum

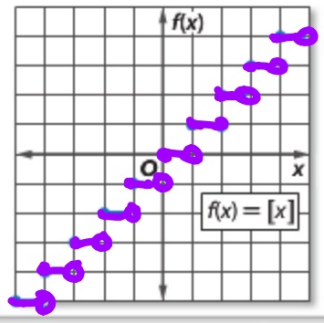
If time goes over, they pay for the whole next hour



Step function

KeyConcept Greatest Integer Function

Parent function:	$f(x) = [\![x]\!]$
Type of graph:	disjointed line segments
Domain:	all real numbers
Range:	all integers



D = ARN

[x] + 3

R = 0, 1, 2 ..
-1, -2 ...

[x-2]

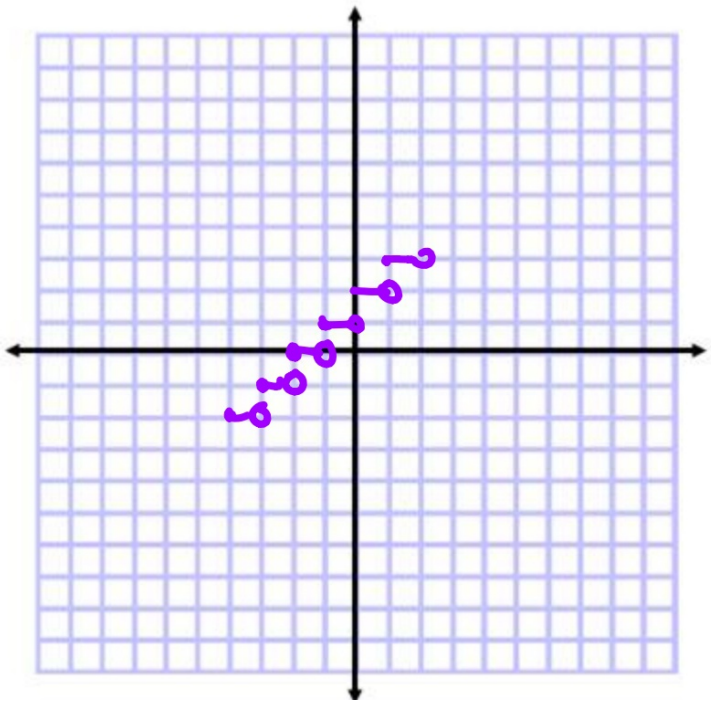
Not continuous ...

integers

Parent graph

Example 1 Greatest Integer Function

Graph $f(x) = [\![x + 2]\!]$. State the domain and range.

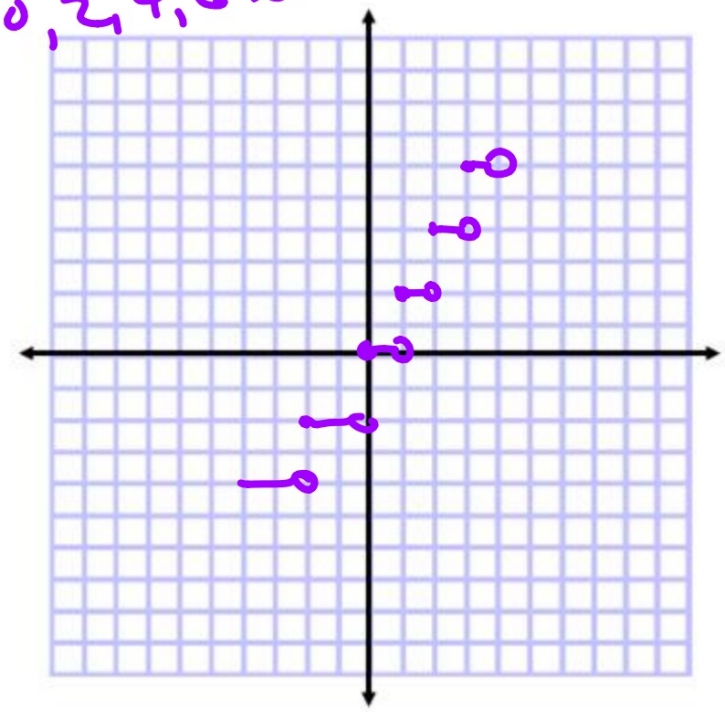


GuidedPractice

9.7 9-14 25,26,27 31-36

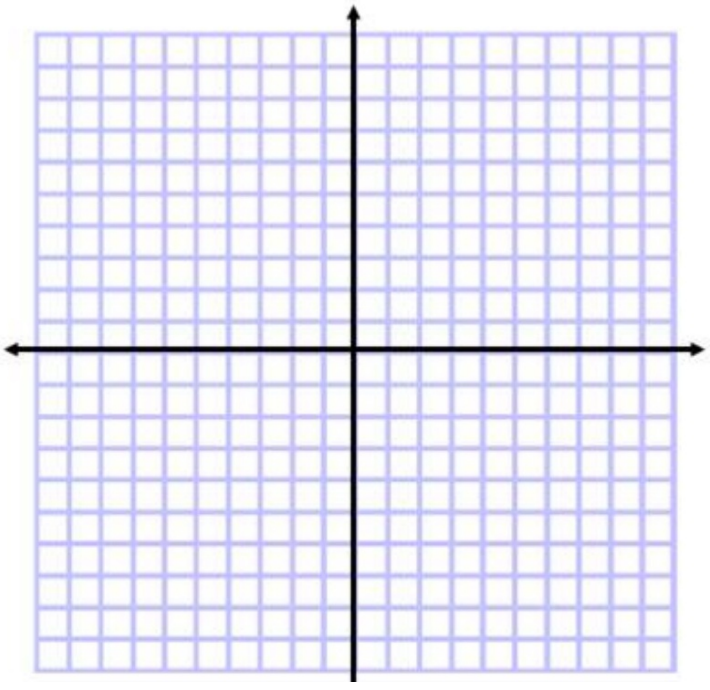
1. Graph $g(x) = 2[\![x]\!]$. State the domain and range.

...-4, -2, 0, 2, 4, 6 ...



GuidedPractice

2. PARKING A garage charges $4 for the first hour and $1 for each additional hour. Draw a graph that represents this situation.



ConceptSummary Special Functions

Step Function	Absolute Value Function	Piecewise-Defined Function