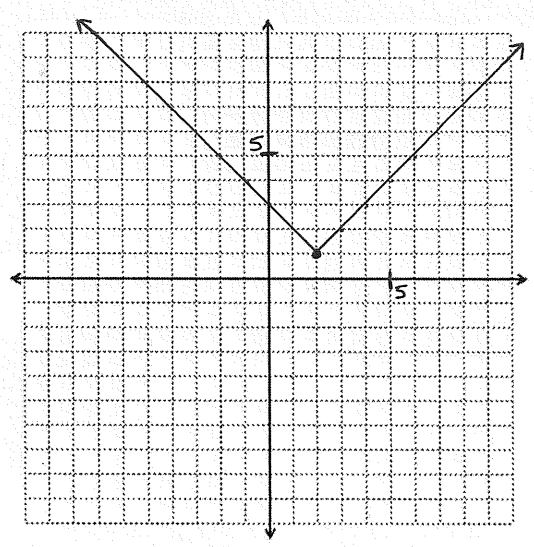
Name Answer Key

PreCalculus; Sec 1.3b – Graphs of Functions

Find the domain and range of the function, then graph. Write your domain and range in interval notation.

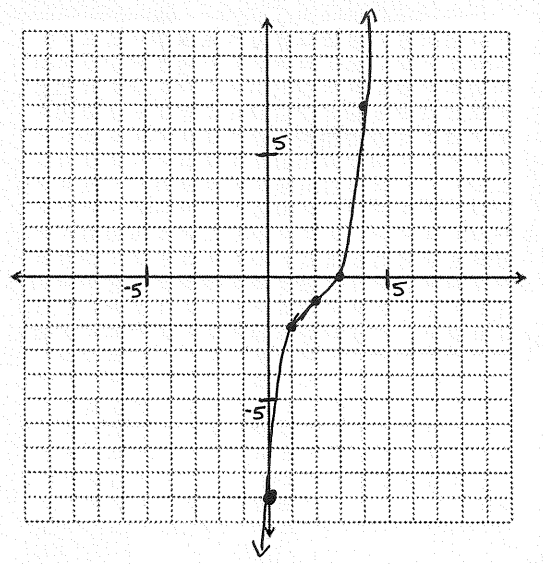
1. $f(x) = |x - 2| + 1$



D: $(-\infty, +\infty)$

R: $[1, +\infty)$

2. $g(x) = (x - 2)^3 - 1$

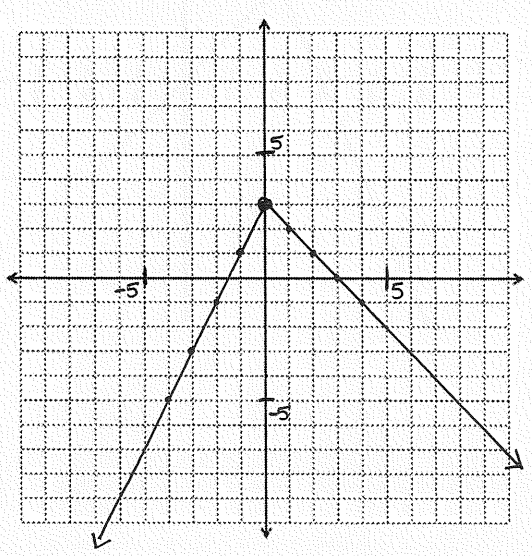


D: $(-\infty, +\infty)$

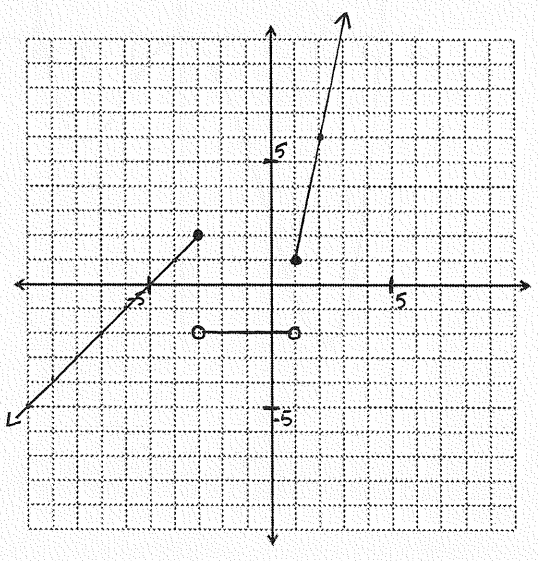
R: $(-\infty, +\infty)$

Sketch the graph of the piecewise-defined function by hand.

3. $f(x) = \begin{cases} 2x + 3, & x < 0 \\ 3 - x, & x \geq 0 \end{cases}$



4. $g(x) = \begin{cases} x + 5, & x \leq -3 \\ -2, & -3 < x < 1 \\ 5x - 4, & x \geq 1 \end{cases}$



Prove algebraically if the function is *even*, *odd*, or *neither.* DO NOT use a graph to justify your answer.

5. $f(x) = x^3 - 5x$

$f(-x) = (-x)^3 - 5(-x)$

$= -x^3 + 5x$

$= -[x^3 - 5x]$

ODD

6. $g(x) = x\sqrt{x+5}$

$g(-x) = (-x)\sqrt{-x+5}$

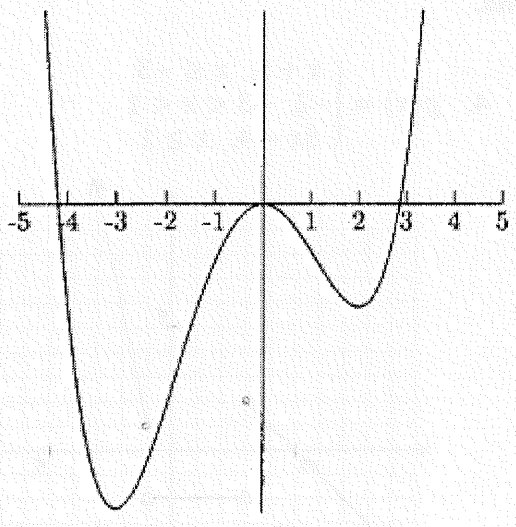
$= -x\sqrt{5-x}$

$= -[x\sqrt{5-x}]$

NEITHER

Find the interval(s) where the function is *increasing* or *decreasing* (use interval notation). Then determine the *domain* in interval notation.

7. increasing: $(-3, 0)\ (2, +\infty)$
decreasing: $(-\infty, -3)\ (0, 2)$
domain: $(-\infty, +\infty)$



8. increasing: $[-5, -2)\ (4, 5)$
decreasing: $(-2, 2)$
domain: $[-5, 5]$