

MATH 100
Sections 8.1-8.3
Key for Supplemental Worksheet

Find the domain of the following rational functions. Express answers in interval notation.

(1) $f(x) = \frac{3}{x-4}$

$D: (-\infty, 4) \cup (4, \infty)$

(2) $g(x) = \frac{3}{x^2+5x+6}$

$D: (-\infty, -3) \cup (-3, -2) \cup (-2, \infty)$

(3) $y = \frac{4x}{x^2-x-12}$

$D: (-\infty, -3) \cup (-3, 4) \cup (4, \infty)$

(4) $y = \frac{x+5}{x^2+4x}$

$D: (-\infty, -4) \cup (-4, 0) \cup (0, \infty)$

(5) $g(x) = \frac{x}{6x^2+13x-5}$

$D: (-\infty, -\frac{5}{2}) \cup (-\frac{5}{2}, \frac{1}{3}) \cup (\frac{1}{3}, \infty)$

Find the domain and range of the following functions. Express answers in interval notation.

(6) $y = -\sqrt{5x+1}$

$D: [-\frac{1}{5}, \infty)$
 $R: (-\infty, 0]$

(7) $f(x) = \sqrt{3x-4}$

$D: [\frac{4}{3}, \infty)$
 $R: [0, \infty)$

(8) $y = x^2 - 4x + 4$

$D: (-\infty, \infty)$
 $R: [0, \infty)$

(9) $f(x) = 2x + 5$

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

Find each of the following:

(10) If $f(x) = \begin{cases} 3x+2 & \text{for } x \geq 0 \\ 5x-1 & \text{for } x < 0 \end{cases}$,

find: $f(2)$, $f(6)$, $f(-1)$, and $f(0)$.

8
20
-6
2

(11) If $f(x) = \begin{cases} 2 & \text{for } x < 0 \\ x^2+1 & \text{for } 0 \leq x \leq 4, \\ -1 & \text{for } x > 4 \end{cases}$,

find: $f(3)$, $f(6)$, $f(0)$, and $f(-3)$.

10
-1
1
2