Name __KEY__

Domain & Range Practice for Radical/Rational Functions

Examples (done together as a class): Sketch based on transformation and find domain & range.

$f(x) = \sqrt{x-5} + 2$

$$X - 5 \geq 0$$
$$X \geq 5$$

$D: [5, \infty)$

$R: [2, \infty)$

$f(x) = -2\sqrt{5x+9} - 8$

$$5x + 9 \geq 0$$
$$X \geq \frac{-9}{5}$$

$D: [-\frac{9}{5}, \infty)$

$R: (-\infty, -8]$

Find the domain and range for the following radical functions. Use interval notation.

1. $f(x) = 4\sqrt{x-8} + 3$

$$X - 8 \geq 0$$

$D: [8, \infty)$

$R: [3, \infty)$

2. $f(x) = -\sqrt{x+2}$

$$X + 2 \geq 0$$

$D: [-2, \infty)$

$R: (-\infty, 0]$

3. $f(x) = 5 + 2\sqrt{x-6}$

$$X - 6 \geq 0$$

$D: [6, \infty)$

$R: [5, \infty)$

4. $f(x) = 5\sqrt{3x+9} - 1$

$$-3x + 9 \geq 0$$
$$x \leq 3$$

$D: (-\infty, 3]$

$R: [-1, \infty)$

5. $f(x) = \sqrt{2x+7}$

$$-2x + 7 \geq 0$$
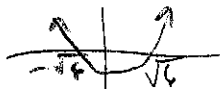$$x \leq \frac{7}{2}$$

$D: (-\infty, \frac{7}{2}]$

$R: [0, \infty)$

6. $f(x) = \sqrt{x^2 - 6}$

$$x^2 - 6 = 0$$
$$x = \pm\sqrt{6}$$

$$x^2 - 6 \geq 0$$

Not easily solvable b/c taking the square root w/ inequalities Sketch a graph/factor when necessary.

$D: (-\infty, -\sqrt{6}] \cup [\sqrt{6}, \infty)$

$R: [0, \infty)$

Examples (done together as a class):

$f(x) = \frac{1}{x-8} + 4$

$$X - 8 \neq 0$$
$$X \neq 8$$

D: $(-\infty, 8) \cup (8, \infty)$

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

$f(x) = \frac{-5}{x+10} - 7$

$$X + 10 \neq 0$$
$$X \neq -10$$

D: $(-\infty, -10) \cup (-10, \infty)$

R: $(-\infty, -7) \cup (-7, \infty)$

Find the domain and range for the following rational functions. Use interval notation.

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

$$X + 3 \neq 0$$
$$X \neq -3$$

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

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

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

$$X - 1 \neq 0$$
$$X \neq 1$$

D: $(-\infty, 1) \cup (1, \infty)$

R: $(-\infty, 0) \cup (0, \infty)$

3. $f(x) = 4 + \frac{-6}{x-7}$

$$X - 7 \neq 0$$
$$X \neq 7$$

D: $(-\infty, 7) \cup (7, \infty)$

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

4. $f(x) = \frac{1}{6x-12} + 5$

$$6x - 12 \neq 0$$
$$X \neq 2$$

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

R: $(-\infty, 5) \cup (5, \infty)$

5. $f(x) = \frac{-7}{5x+3}$

$$5x + 3 \neq 0$$
$$X \neq -\frac{2}{5}$$

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

R: $(-\infty, 0) \cup (0, \infty)$

6. $f(x) = \frac{1}{x^2-5} + 9$

$$X^2 - 5 \neq 0$$
$$X \neq \pm\sqrt{5}$$

D: $(-\infty, -\sqrt{5}) \cup (-\sqrt{5}, \sqrt{5}) \cup (\sqrt{5}, \infty)$

R: $(-\infty, 9) \cup (9, \infty)$