

**FINDING DOMAIN ALGEBRAICALLY**

**CASE 1: FRACTIONS**

Directions: State the domain in interval notation.

1.)  $y = \frac{1}{x}$

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

2.)  $y = \frac{1}{x-2}$

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

3.)  $f(x) = \frac{8}{3x+9}$

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

4.)  $f(x) = \frac{x^3}{x^2-4x-96}$

$(-\infty, -8) \cup (-8, 12) \cup (12, \infty)$

5.)  $y = \frac{6x}{x^2+7x+12}$

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

6.)  $y = \frac{3x^2-8x}{2x^2-5x-3}$

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

**CASE 2: RADICALS**

Directions: State the domain in interval notation.

7.)  $y = \sqrt{x-3}$

$[3, \infty)$

8.)  $y = \sqrt{2x+8}$

$[-4, \infty)$

9.)  $y = \sqrt{x^2-9}$

$(-\infty, -3] \cup [3, \infty)$

10.)  $y = \sqrt[3]{1-x^2}$

$(-\infty, \infty)$

11.)  $f(x) = \sqrt{4-x^2}$

$[-2, 2]$

12.)  $f(x) = \sqrt{x^2+x-12}$

$(-\infty, -4] \cup [3, \infty)$

**CASE 3: FRACTION & RADICAL COMBINATION**

Directions: State the domain in interval notation.

13.)  $f(x) = \frac{5}{\sqrt{2x-10}}$

$(5, \infty)$

14.)  $f(x) = \frac{9}{\sqrt{x^2-144}}$

$(-\infty, -12) \cup (12, \infty)$

15.)  $f(x) = \frac{11}{\sqrt{x^2-100}}$

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

16.)  $y = \frac{\sqrt{x^2-36}}{2x-8}$

$(-\infty, -6] \cup [6, \infty)$

17.)  $y = \frac{\sqrt{x^2-25}}{3x-24}$

$(-\infty, -5] \cup [5, 8) \cup (8, \infty)$

18.)  $y = \frac{\sqrt{9-x^2}}{x^2+7x+10}$

$[-3, -2) \cup (-2, 3]$

MIXED PRACTICE: State the domain in interval notation.

19.)  $y = \frac{5x^3-9}{x^3+13x^2+42x}$

$(-\infty, -7) \cup (-7, -6) \cup (-6, 0) \cup (0, \infty)$

20.)  $f(x) = \frac{\sqrt{x^2-9x+8}}{x^2-16x+63}$

$(-\infty, 1] \cup [8, 9) \cup (9, \infty)$

21.)  $f(x) = \frac{\sqrt{x^2-7x-18}}{x^2-5x-14}$

$(-\infty, -2) \cup [9, \infty)$

22.)  $f(x) = \sqrt{25-5x}$

$(-\infty, 5]$

23.)  $f(x) = 8x^3 - 13x^2 + 9x - 4$

$(-\infty, \infty)$

24.)  $f(x) = \frac{x+9}{\sqrt{x^2+x-72}}$

$(-\infty, -9) \cup (8, \infty)$

25.)  $f(x) = \frac{\sqrt{7x^2-31x-20}}{7x^2+9x}$

$(-\infty, -\frac{9}{7}) \cup (-\frac{9}{7}, -\frac{4}{7}] \cup [5, \infty)$

26.)  $f(x) = \sqrt{8x^2 - 48x}$

$(-\infty, 0] \cup [6, \infty)$