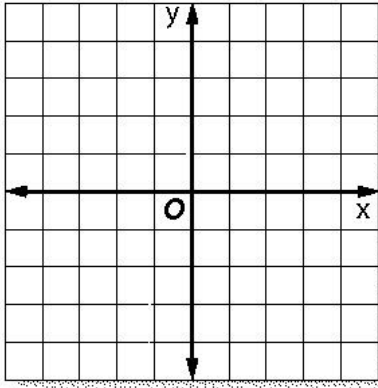


Unit 7: Rational Functions

1) Graph the function and state the domain and range.

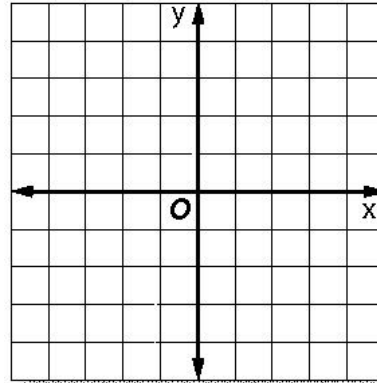
$$y = \frac{-1}{x+4}$$



D: _____ R: _____

2) Graph and state the domain and range

$$g(x) = \frac{4x + 5}{x + 1}$$



D: _____ R: _____

3) Find the quotient:

$$\frac{4x}{5x - 20} \div \frac{x^2 - 2x}{x^2 - 6x + 8}$$

4) Simplify:

$$\frac{x^2 - 2x - 3}{x^2 - x - 6}$$

5) Simplify:

$$\frac{x^4 - 16}{5x^3 - 3x^2 + 20x - 12}$$

6) Find the product:

$$\frac{x^2 - x - 6}{x^2 + 8x + 16} \cdot \frac{3x^2 + 12x}{x^2 - 2x - 3}$$

7) Find the difference:

$$\frac{x^2 - 3}{x^2 - 6x - 16} - \frac{x + 5}{x + 2}$$

8) Find the sum:

$$\frac{7}{x^2 - 5x - 24} + \frac{3}{x - 8}$$

9) Solve:

$$\frac{2}{x - 4} = \frac{x - 3}{x - 1}$$

10) Solve:

$$\frac{x - 5}{4} = \frac{x^2 - 5}{x + 4}$$

11) Solve:

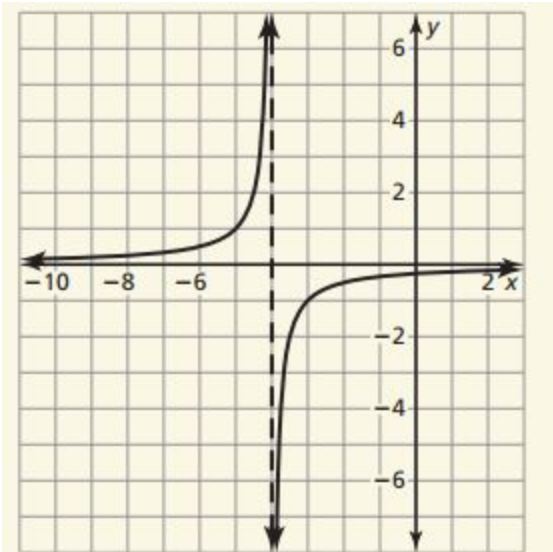
$$\frac{x - 4}{x - 5} + 5 = \frac{4x}{x}$$

12) Solve:

$$\frac{4}{x} - 1 = \frac{4}{x + 2}$$

ANSWERS:

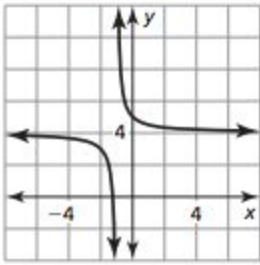
1)



domain: all real numbers except -4 ;
range: all real numbers except 0

2) D: all reals except -1 , R: all reals except 4

$$g(x) = \frac{1}{x+1} + 4$$



translation 1 unit left and 4 units up

3)

$$\frac{4}{5}, x \neq 0, x \neq 2, x \neq 4$$

4)

$$\frac{x+1}{x+2}, x \neq 3$$

5)

$$\frac{x^2 - 4}{5x - 3}$$

6)

$$\frac{3x(x+2)}{(x+1)(x+4)}, x \neq 3$$

7)

$$\frac{3x + 37}{(x+2)(x-8)}$$

8)

$$\frac{3x + 16}{(x - 8)(x + 3)}$$

9)

$$x = 2, 7$$

10)

$$x = 0, -\frac{1}{3}$$

11)

$$x = \frac{9}{2}$$

12)

$$x = 2, -4$$