



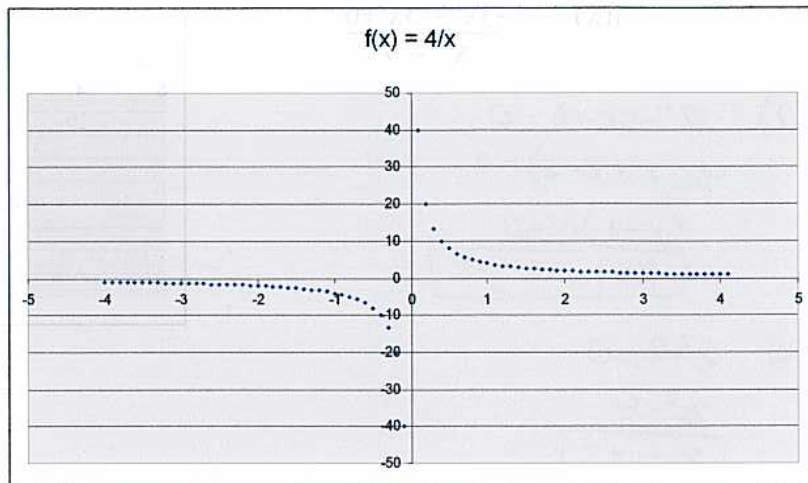
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1. Sketch the graph. (5 points)

x	$f(x)$
-5	$-4/5$
-4	-1
-3	$-4/3$
-2	-2
-1	-4
0	∞
1	4
2	2
3	$4/3$
4	1
5	$4/5$

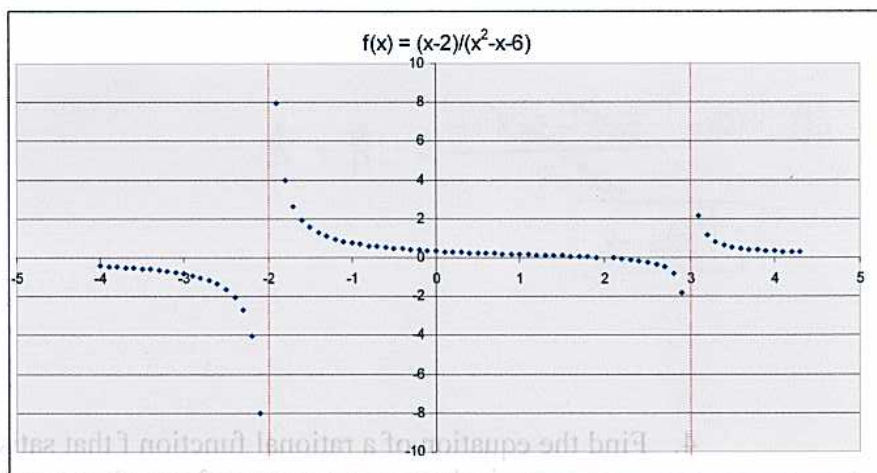
$$f(x) = 4/x$$



2. Sketch the graph of f. (5 points)

- x-intercept
- Vertical Asymptote
- Horizontal Asymptote
- y-intercept

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



a) $x-2=0$
 $x=2$

b) $x^2-x-6=0$

$(x-3)(x+2)$

$x=3, x=-2$

c) coef numerator < coef denom.
 $y=0$

d) $f(0) = \frac{0-2}{0^2-0-6} = \frac{-2}{-6} = \frac{1}{3}$

x $f(x)$
-4 -0.43

-3 -0.83

-2 ∞

-1 0.75

0 0.33

1 0.17

2 0

3 ∞

4 0.33

3. Sketch the graph of f. (5 points)

- x-intercept
- Vertical Asymptote
- Horizontal Asymptote
- y-intercept

$$f(x) = \frac{-3x^2 - 3x + 6}{x^2 - 9}$$

a) $-3x^2 - 3x + 6 = 0$

$$-3(x^2 + x - 2) = 0$$

$$\frac{(x-1)(x+2)}{x=1, x=-2}$$

b) $x^2 - 9 = 0$

$$x^2 = 9$$

$$x = \pm 3$$

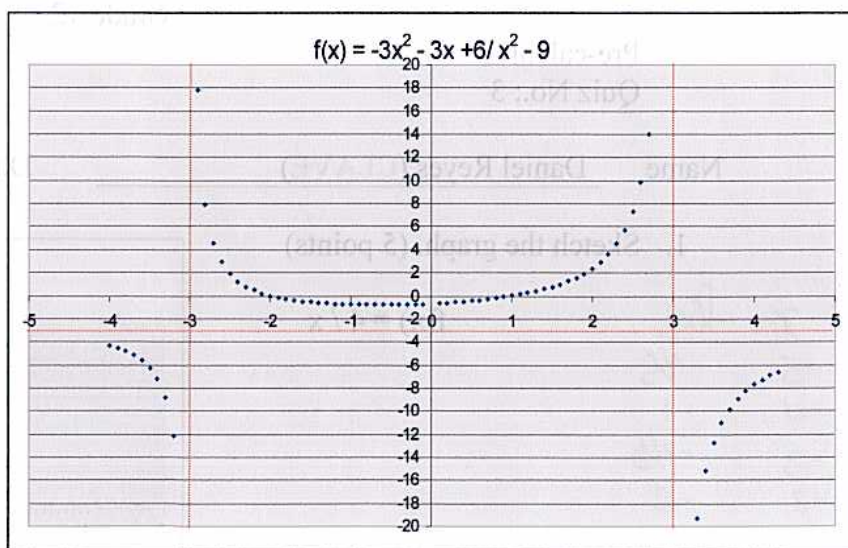
c) Coef numerator = coef denom.

$$y = -3/1 = -3$$

$$y = -3$$

d) $f(0) = \frac{-3(0)^2 - 3(0) + 6}{0^2 - 9} = -\frac{6}{9} = -\frac{2}{3}$

$$f(0) = -\frac{2}{3}$$



4. Find the equation of a rational function f that satisfies the given conditions.

- vertical asymptotes : $x = -2, x = 0$
- horizontal asymptote : $y = 0$
- x - intercept : 2
- $f(3) = 1$

$$f(x) = \frac{x-2}{(x-0)(x+2)} = \frac{x-2}{x^2+2x}$$

- degree of numerator < degree of denominator
Then $y=0$

find lead coef. by substitution } $f(3) = 1 = a \frac{3-2}{3^2+2(3)} = a \frac{1}{9+6} = a \frac{1}{15}$

$$1 = a \frac{1}{15}$$

$$a = 15$$

$$\rightarrow f(x) = 15 \frac{(x-2)}{x^2+2x} = \frac{15x-30}{x^2+2x}$$