1. Let \( f(x) = \frac{1-3x}{1-x} \).

Find the following:

a) Domain:

b) \( x \)-intercept(s):

c) \( y \)-intercept(s):

d) Horizontal Asymptotes

e) Vertical Asymptotes

f) TWO additional points for each region

g) Use your answers for parts (a) – (f) to sketch the graph of \( f(x) \) on the graph below.
2. Let \( f(x) = \frac{3x + 4}{x^2 + x - 6} \).

Find the following:

a) Domain:

b) \( x \)-intercept(s):

c) \( y \)-intercept(s):

d) Horizontal Asymptotes

e) Vertical Asymptotes

f) TWO additional points for each region

g) Use your answers for parts (a) – (f) to sketch the graph of \( f(x) \) on the graph below.
3. Let \( f(x) = \frac{x^2 - 9}{x^2 - 2x + 3} \).

Find the following:

a) Domain:

b) \( x\)-intercept(s):

c) \( y\)-intercept(s):

d) Horizontal Asymptotes:

e) Vertical Asymptotes:

f) **TWO** additional points for each region

g) Use your answers for parts (a) – (f) to sketch the graph of \( f(x) \) on the graph below.
4. Let \( f(x) = \frac{2x^2}{x^2 + 9} \).

Find the following:

a) Domain:

b) \( x \)-intercept(s):

c) \( y \)-intercept(s):

d) Horizontal Asymptotes

e) Vertical Asymptotes

f) **TWO** additional points for each region

g) Use your answers for parts (a) – (f) to sketch the graph of \( f(x) \) on the graph below.
5. Find the formula of a rational function with vertical asymptotes \( x = 1 \) and \( x = -1 \), horizontal asymptote \( y = 0 \), and \( x \)-intercept 4.

6. Find the formula for a rational function having domain \( (-\infty, -1) \cup (-1, 1) \cup (1, \infty) \).

7. Find the formula for a rational function with the denominator a polynomial of degree 2 whose graph lies completely above the \( x \)-axis.
8. Find a formula for the rational function given in the graph below.