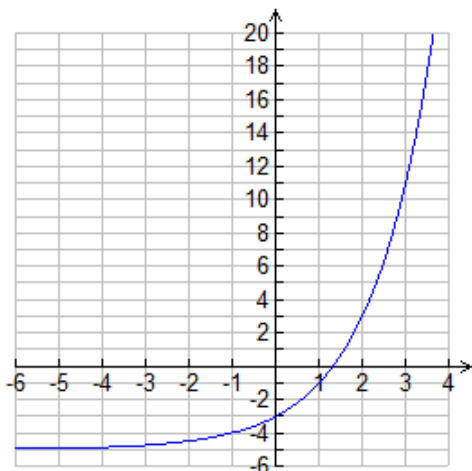


MHF4UO FINAL EXAM REVIEW #1 – CHARACTERISTICS AND BEHAVIOUR OF FUNCTIONS



Equation of Function: _____ (Hint: $a = 2$)

Domain: _____

Range: _____

Equation of Horizontal Asymptote: _____ (Sketch asymptote on grid)

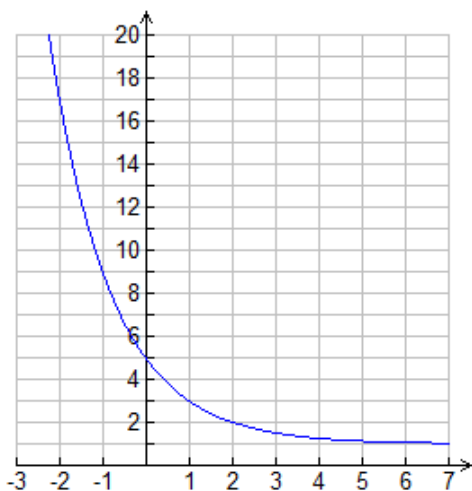
As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____

Average Rate of Change (slope of secant) over any interval is _____

Instantaneous Rate of Change (slope of tangent) at any point is _____

Interval(s) of Increase: _____ Interval(s) of Decrease: _____



Equation of Function: _____ (Hint: $a = \frac{1}{2}$)

Domain: _____

Range: _____

Equation of Horizontal Asymptote: _____ (Sketch asymptote on grid)

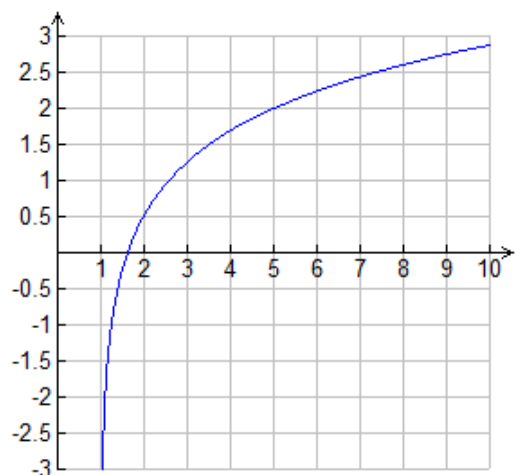
As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____

Average Rate of Change (slope of secant) over any interval is _____

Instantaneous Rate of Change (slope of tangent) at any point is _____

Interval(s) of Increase: _____ Interval(s) of Decrease: _____



Equation of Function: _____ (Hint: $a = 4$)

Domain: _____

Range: _____

Equation of Vertical Asymptote: _____ (Sketch asymptote on grid)

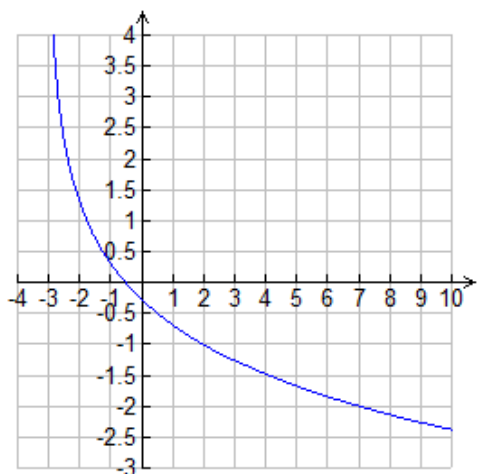
As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

As $x \rightarrow 1^+$, $f(x) \rightarrow$ _____

Average Rate of Change (slope of secant) over any interval is _____

Instantaneous Rate of Change (slope of tangent) at any point is _____

Interval(s) of Increase: _____ Interval(s) of Decrease: _____



Equation of Function: _____ (Hint: $a = \frac{1}{4}$)

Domain: _____

Range: _____

Equation of Vertical Asymptote: _____ (Sketch asymptote on grid)

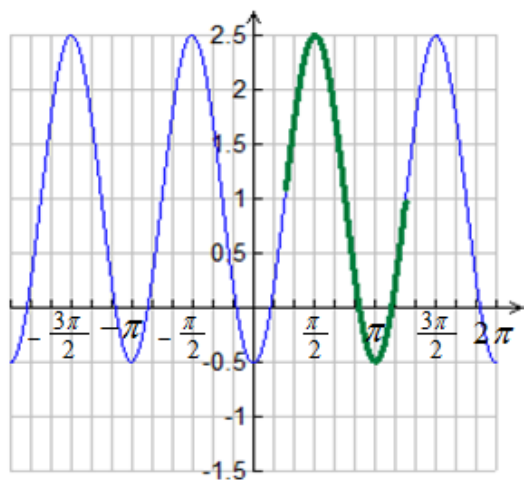
As $x \rightarrow \infty$, $f(x) \rightarrow$ _____

As $x \rightarrow -3^+$, $f(x) \rightarrow$ _____

Average Rate of Change (slope of secant) over any interval is _____

Instantaneous Rate of Change (slope of tangent) at any point is _____

Interval(s) of Increase: _____ Interval(s) of Decrease: _____



Amplitude: _____ Vertical Displacement: _____

Period: _____ Phase Shift: _____

Equation of Function: _____

Domain: _____

Range: _____

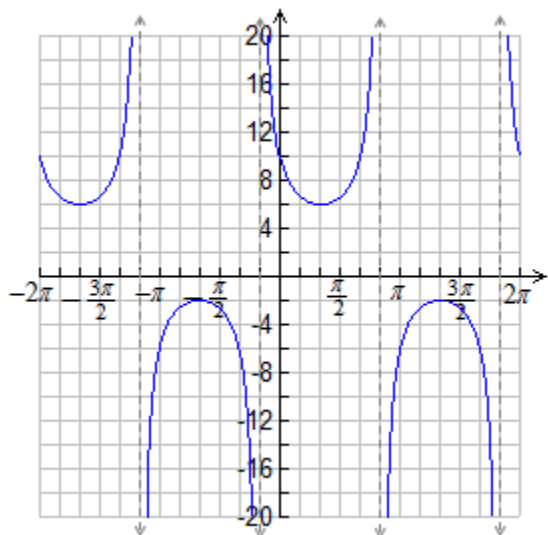
Average Rate of Change (slope of secant) from $(0, -0.5)$ to $(\frac{3\pi}{2}, 2.5)$: _____

Instantaneous Rate of Change (slope of tangent) at $x = \frac{\pi}{2}$ is _____

Interval(s) of Increase: _____

Interval(s) of Decrease: _____

Turning Points: _____



Vertical Stretch Factor: _____ Vertical Displacement: _____

Period: _____ Phase Shift: _____

Equation of Function: _____

Domain: _____

Range: _____

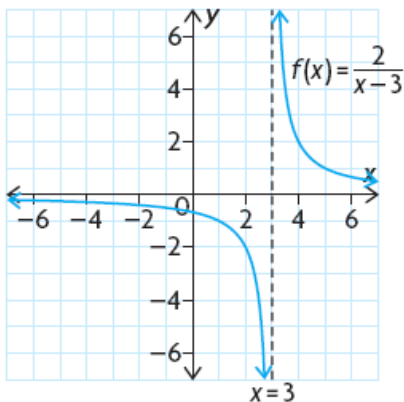
Average Rate of Change (slope of secant) from $(\pi, -6)$ to $(\frac{4\pi}{3}, -2)$: _____

Instantaneous Rate of Change (slope of tangent) at $x = \frac{4\pi}{3}$ is _____

Interval(s) of Increase: _____

Interval(s) of Decrease: _____

Turning Points: _____



Domain: _____

Range: _____

Given that the parent function is $g(x) = \frac{1}{x}$, $f(x)$ is obtained by stretching f _____ by a factor of _____ and translating _____ units to the _____.

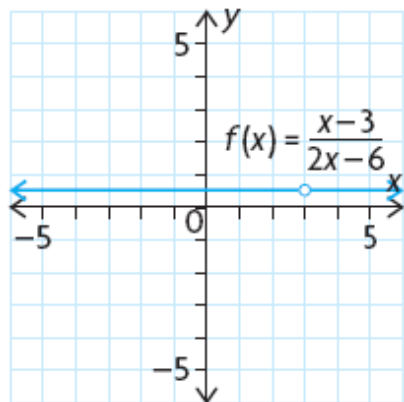
Equation of Vertical Asymptote: _____

Equation of Horizontal Asymptote: _____

As $x \rightarrow \infty$, $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____

As $x \rightarrow 3^-$, $f(x) \rightarrow$ _____ As $x \rightarrow 3^+$, $f(x) \rightarrow$ _____

Interval(s) of Increase: _____ Interval(s) of Decrease: _____



There is a “hole” in f at $x=3$ because division by zero is undefined:

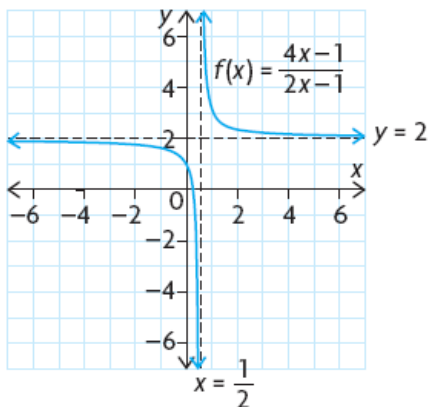
$$f(x) = \frac{x-3}{2x-6} = \frac{x-3}{2(x-3)} = \frac{1}{2}, x \neq 3$$

Domain: _____

Range: _____

As $x \rightarrow \infty$, $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____

Interval(s) of Increase: _____ Interval(s) of Decrease: _____



Domain: _____

Range: _____

Equation of Vertical Asymptote: _____

Equation of Horizontal Asymptote: _____

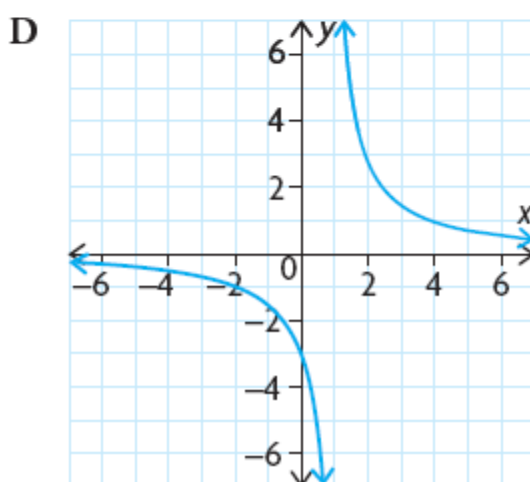
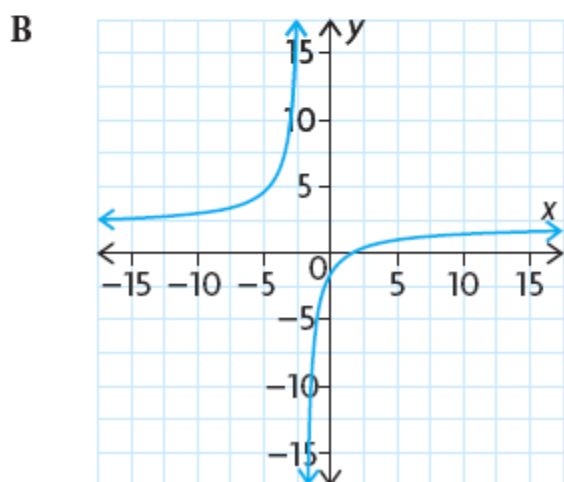
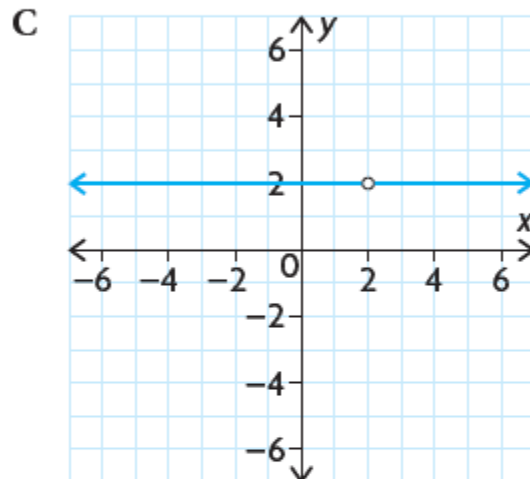
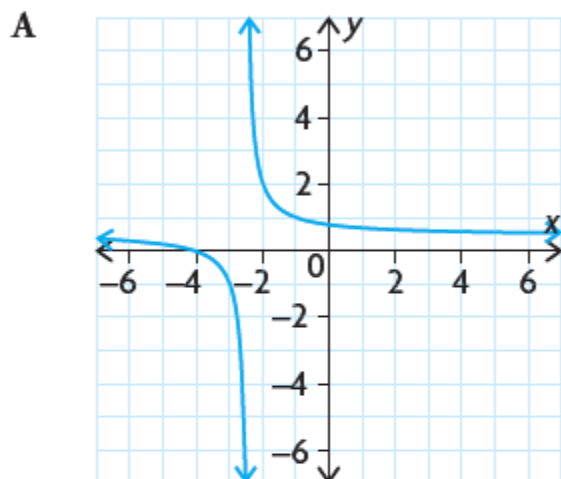
As $x \rightarrow \infty$, $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$, $f(x) \rightarrow$ _____

As $x \rightarrow \frac{1}{2}^-$, $f(x) \rightarrow$ _____ As $x \rightarrow \frac{1}{2}^+$, $f(x) \rightarrow$ _____

Interval(s) of Increase: _____ Interval(s) of Decrease: _____

1. Match each function with its graph.

a) $h(x) = \frac{x+4}{2x+5}$ c) $f(x) = \frac{3}{x-1}$
 b) $m(x) = \frac{2x-4}{x-2}$ d) $g(x) = \frac{2x-3}{x+2}$



2. Consider the function $f(x) = \frac{3}{x-2}$.

- State the equation of the vertical asymptote.
- Use a table of values to determine the behaviour(s) of the function near its vertical asymptote.
- State the equation of the horizontal asymptote.
- Use a table of values to determine the end behaviours of the function near its horizontal asymptote.
- Determine the domain and range.
- Determine the positive and negative intervals.
- Sketch the graph.