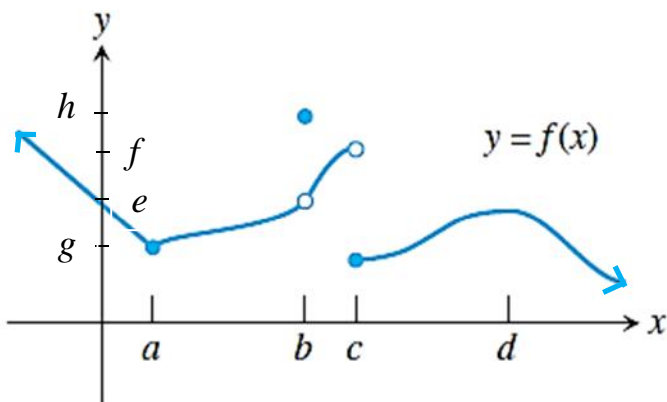


State the domain, range and end behavior as $x \rightarrow \infty$ and $x \rightarrow -\infty$ of the following function. Answer each question.

1.



Domain:

Range:

End Behavior:

Is the function continuous? Why or why not? _____

Where is it not continuous? _____

$f(b) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow b^+} f(x) = \underline{\hspace{2cm}}$
(approach b from the right)

$\lim_{x \rightarrow b^-} f(x) = \underline{\hspace{2cm}}$
(approach b from the left)

$\lim_{x \rightarrow b} f(x) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow a} f(x) = \underline{\hspace{2cm}}$

$\lim_{x \rightarrow c^+} f(x) = \underline{\hspace{2cm}}$

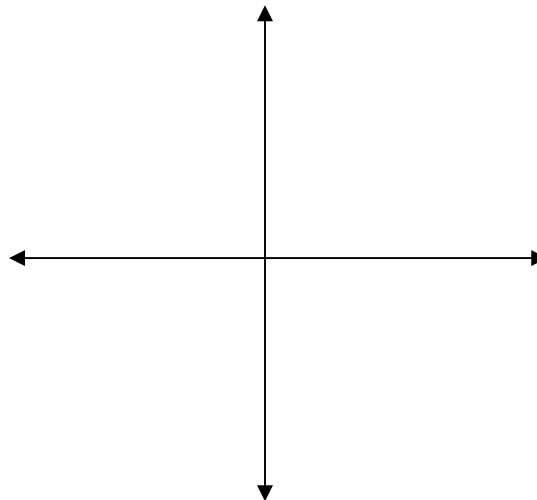
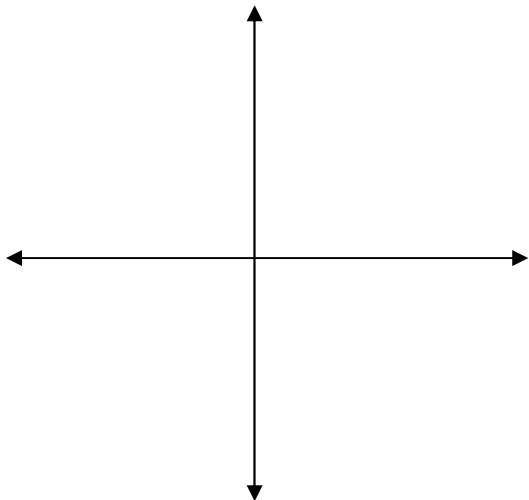
$\lim_{x \rightarrow c^-} f(x) = \underline{\hspace{2cm}}$

What conclusion can you draw about continuity? _____

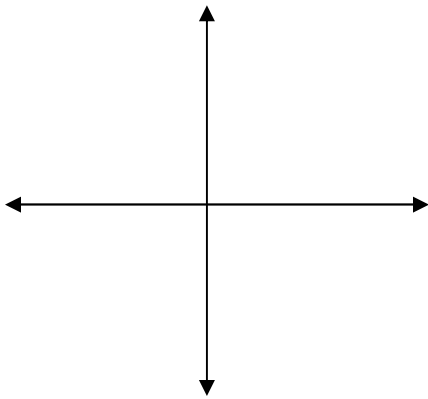
Identify any vertical asymptotes, horizontal asymptotes, slant asymptotes, holes, x-intercepts and y-intercepts. Then graph each function. Describe the end behavior of the function.

2. $f(x) = \left| 2 \sin \left(x - \frac{f}{2} \right) \right|$

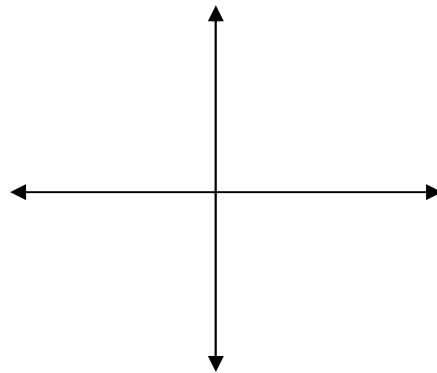
3. $f(x) = \frac{x^2 + 2x - 3}{2x^2 - 12x + 10}$



$$4. f(x) = \frac{x^2 - x}{x + 1}$$



$$5. f(x) = |2x^2 - 10|$$



6. What connection, if any, do you see between the end behavior of the function and the horizontal asymptote(s)?

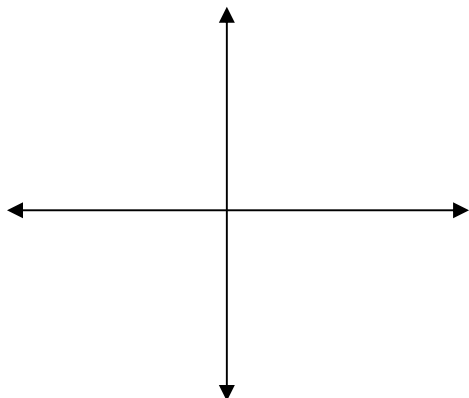
Simplify each function. Then find the domain and equations of any asymptotes.

$$7. f(x) = \frac{1 + \frac{1}{x}}{1 - \frac{1}{x}}$$

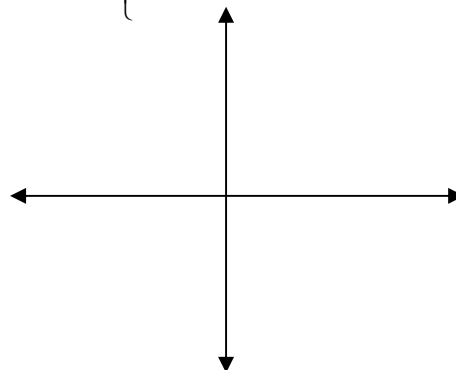
$$8. g(x) = \frac{\frac{1}{x} + \frac{1}{2x+1}}{\frac{4x}{2x+1}}$$

Graph the following functions for #9 & 10. Create and label an appropriate scale.

$$9. f(x) = \begin{cases} x^2 - 3 & \text{for } x < 1 \\ 10 - x & \text{for } 1 \leq x \leq 2 \\ 6x - x^2 & \text{for } x > 2 \end{cases}$$



$$10. f(\theta) = \begin{cases} \sin \theta & \text{for } 0 < \theta < \frac{\pi}{2} \\ \cos \theta & \text{for } \frac{\pi}{2} \leq \theta \leq \pi \\ 2 & \text{for } \theta > \pi \end{cases}$$



For #11 & 12, rationalize the following functions.

$$11. f(x) = \frac{x}{\sqrt{x+1}}$$

$$12. f(x) = \frac{3\sqrt{3}}{2 - \sqrt{3}}$$