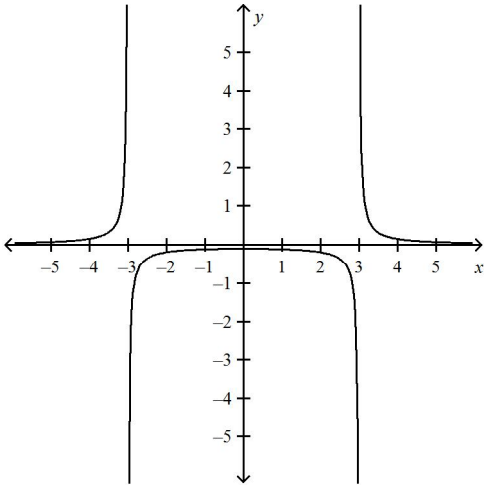
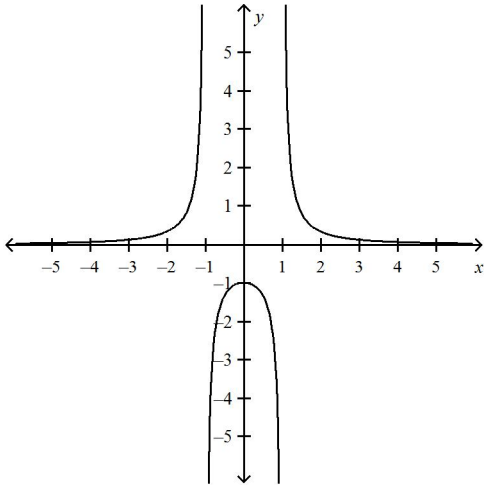
MHF4U Practice for the Chapter 1 Quiz

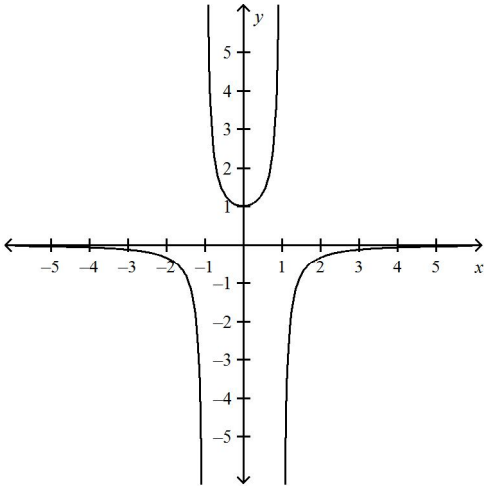
Multiple Choice
Identify the choice that best completes the statement or answers the question.

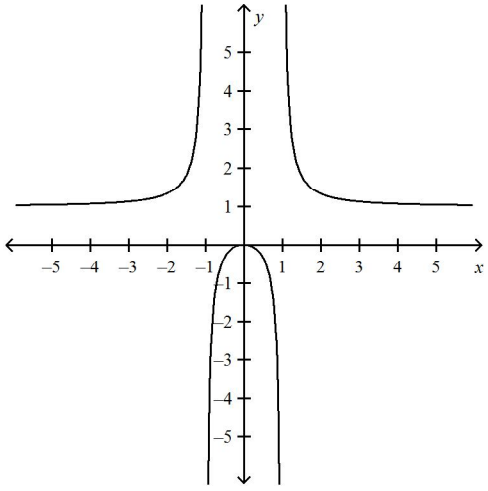
____ 1. What is the domain of the function $f(x) = \sqrt{3-x}$?
a. $\{x \in \mathbf{R} \mid x \le 3\}$
b. $\{x \in \mathbf{R} \mid x \ge 3\}$
c. $\{x \in \mathbf{R} \mid x < 3\}$
d. $\{x \in \mathbf{R} \mid 0 < x \le 3\}$

____ 2. Which graph has all four of the following characteristics?
1) The graph is symmetric with respect to the y-axis.
2) The graph has a vertical asymptote at $x = -1$.
3) The graph has a horizontal asymptote at $y = 0$.
4) The graph is decreasing on the interval $(3, \infty)$.

a.


c.


b.


d.


____ 3. Which one of the following functions is odd?
a. $y = 3 + x$
b. $y = 3x^2$
c. $y = 3^x$
d. $y = x^3$

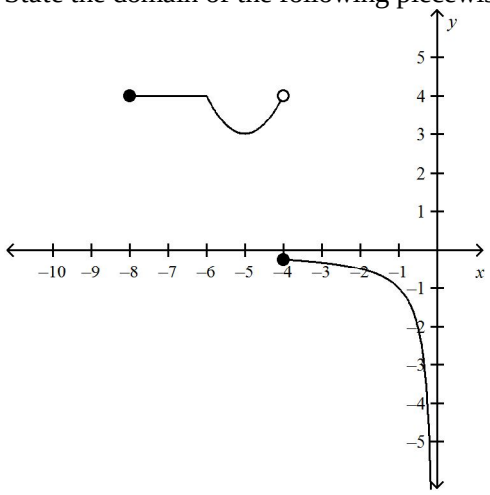
____ 4. Which function would result from stretching $y = f(x)$ vertically by a factor of 3 and then vertically translating the graph 6 units down?

a. $y = 3f(x) - 6$
b. $y = 3f(x - 6)$
c. $y = f(3x) - 6$
d. $y = f(3x - 6)$

____ 5. If $f(x) = \frac{x^2}{k} + 1$ and $f^{-1}(5) = 6$, find k.

a. 9
b. 5
c. 6
d. $\frac{6}{4}$

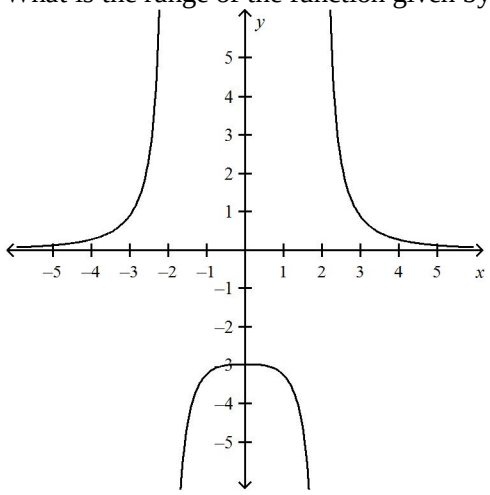
____ 6. State the domain of the following piecewise function.



a. D = $\{x \in \mathbf{R} \mid -8 \le x < 0\}$
b. D = $x \in \mathbf{R} \mid -8 < x \le 0\}$
c. D = $\{x \in \mathbf{R} \mid -8 \le x \le 0\}$
d. D = $\{x \in \mathbf{R} \mid -8 < x < 0\}$

Short Answer

7. What is the range of the function given by the following graph?



8. Consider the functions $f(x) = \sqrt{x-1}$ and $g(x) = \dfrac{x-3}{x^2 - x - 6}$. Which real numbers are in the domains of both $f(x)$ and $g(x)$?

9. Determine whether the function $f(x) = \dfrac{1+x^2}{|x|}$ is even, odd, or neither.

10. Determine whether the function $f(x) = x^3 + 3x^2 + 1$ is even, odd, or neither.

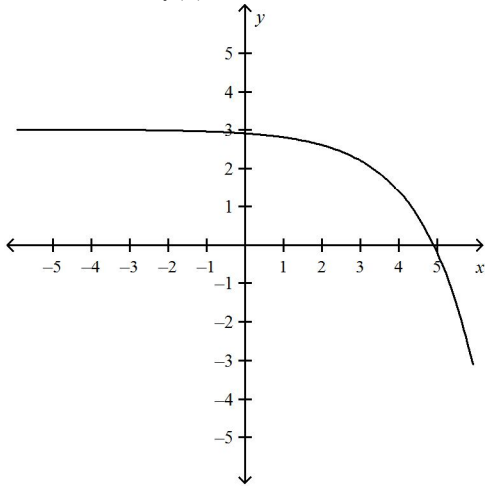
11. Identify the intervals of increase/decrease for the function $f(x) = \dfrac{2}{3x}$.

12. Identify the intervals of increase/decrease for the function $f(x) = (x-1)(x-3)$.

13. State the parent function of the equation $y = 1 + 3\sqrt{x+2}$ and the transformations that were applied.

14. Is the inverse of the equation $y = (x+5)^2$ a function?

15. The function $f(x)$ is shown below. Is the inverse of $f(x)$ a function?



16. If $f(x)$ has a domain of $\{x \in \mathbf{R} \mid x \geq 0\}$ and a range of $\{y \in \mathbf{R} \mid -5 \leq y \leq 5\}$, state the domain and range of the inverse.

17. State whether piecewise function $f(x) = \begin{cases} x, \text{ if } x \leq 0 \\ 0, \text{ if } 0 < x < 5 \\ 2x - 10, \text{ if } x > 5 \end{cases}$ is continuous. If it is not continuous, state where it is not.

18. Graph the following piecewise function: $g(x) = \begin{cases} 5, \text{ if } 0 \le x < 6 \\ 9-(x-8)^2, \text{ if } 6 < x \le 10 \end{cases}$.

19. Determine the algebraic representation of the following piecewise function.