Unit 1 Practice Test

1. If an interval is given, draw the interval on the number line. If a number line range is given, determine the interval in terms of absolute values.

   (a) $|x| > 1$

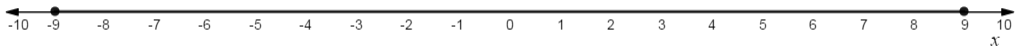
   (b) _____

   (c) $|x| < 3$

   (d) $|x| \leq 7$

   (e) _____

   (f) _____

   (g) $|x| \geq 4$

2. Determine if each of the following functions are even, odd, both, or neither.

   (a) $f(x) = x^2 - 3$ _____

   (b) $g(x) = x^3$ _____

   (c) $h(x) = 0$ _____

   (d) $j(x) = 12$ _____

   (e) $l(x) = \frac{13}{x}$ _____

3. Prove that $f(x) = 2^x + 2^{-x}$ is even.

4. For each of the following functions,

   i) State the domain and range.

   ii) State the base function.

   iii) State the transformations (vertical stretch a, vertical translation c, horizontal compression k, horizontal translation d, and any reflections).

   iv) Draw the function with a smooth line and its base function with a dotted line.

   v) Determine if the inverse relation of the function is the last page or not. If so, state the figure number.

   (a) $y(x) = 8x - 4$

(b) $f(x) = |2(x-3)| + 1$

(c) $g(x) = -\frac{1}{2}(x+2)^3 - 3$

(d) $h(x) = \dfrac{3}{x+1}$

(e) $A(x) = \pi x^2$

5. Consider the following piecewise function.

$$f(x) = \begin{cases} 2(x+5)^2 & x < -4 \\ \left|\frac{x}{2}\right| & -4 \leq x \leq 1 \\ x & 2 < x \end{cases}$$

(a) State the domain, range, and transformations for each of the pieces of the piecewise function $f(x)$. Keep in mind the domain is controlled by the piecewise function.

i. When $x < -4$:

ii. When $-4 \leq x \leq 1$:

iii. When $2 < x$:

(b) Evaluate the following:

i. $g(-4)$ where $g(x) = 2(x+5)^2$.

ii. $h(-4)$ and $h(1)$ where $h(x) = \left|\frac{x}{2}\right|$.

(c) Is the function discontinuous anywhere? If so, state where.

(d) Graph the function.

(e) Graph its inverse relation.

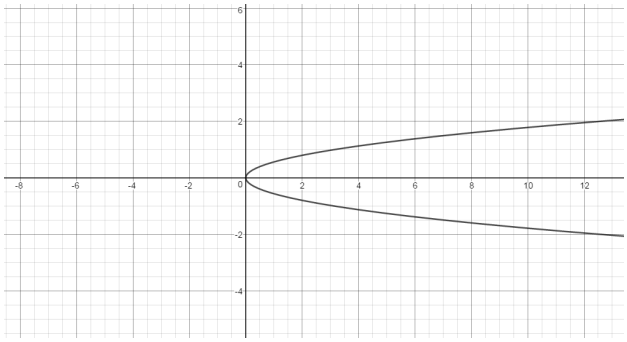


Figure 1

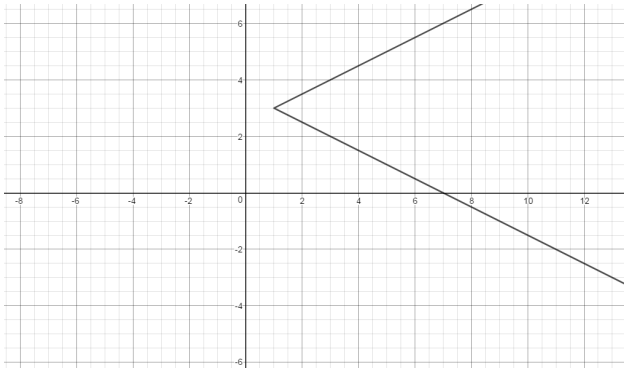


Figure 2

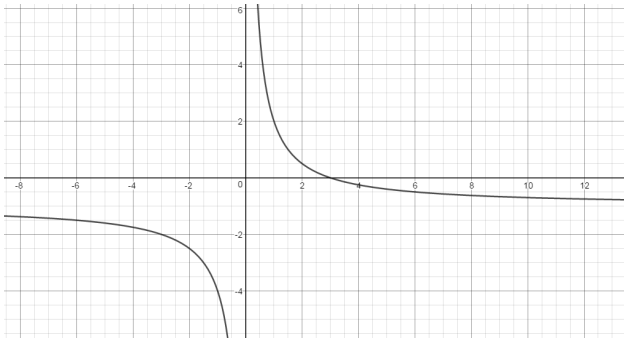


Figure 3

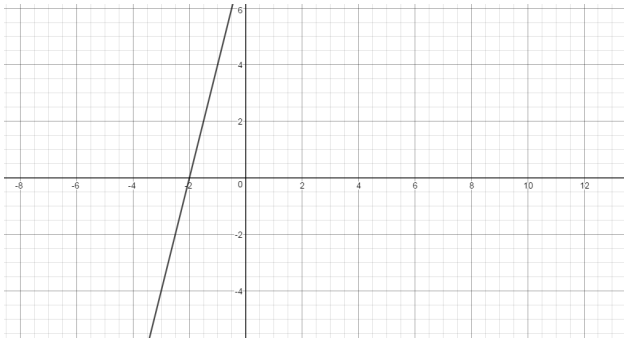


Figure 4

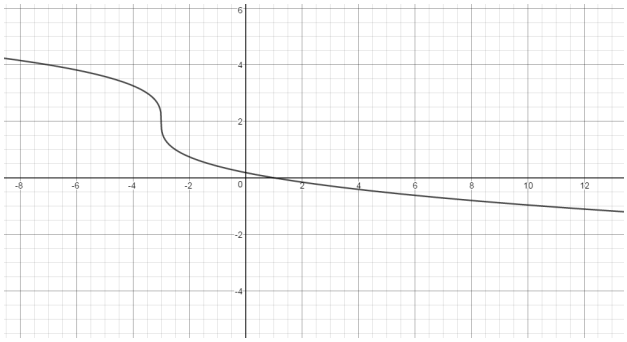


Figure 5

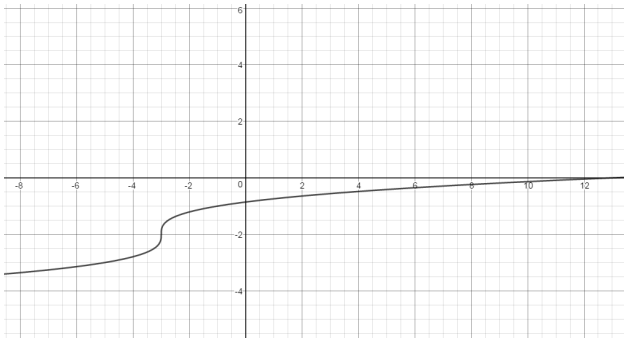


Figure 6

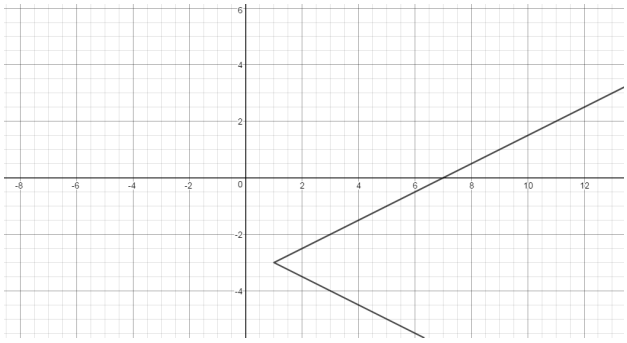


Figure 7

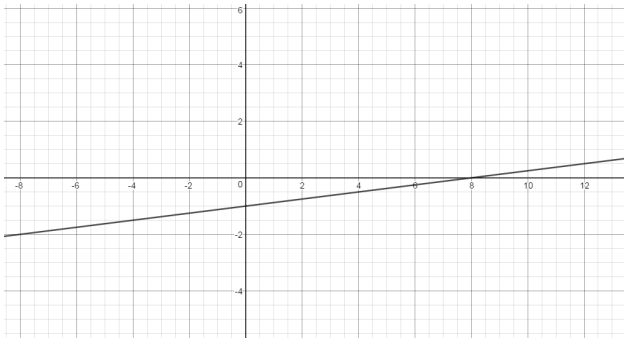


Figure 8