Midterm 1 practice
Math 32 Spring 2022 Name: _____

No notes, calculators, or other aids are allowed. Read all directions carefully and write your answers in the space provided. To receive full credit, you must show all of your work.

1. Determine all values of x that satisfy the following equation,

$$|x-1|+|x|=3$$

2. Determine all values of x that satisfy the following inequality,

$$|x+3| \geq 4$$

3. Write the following in interval notation.
   (a) $\{x : 2 < x \leq 10\}$

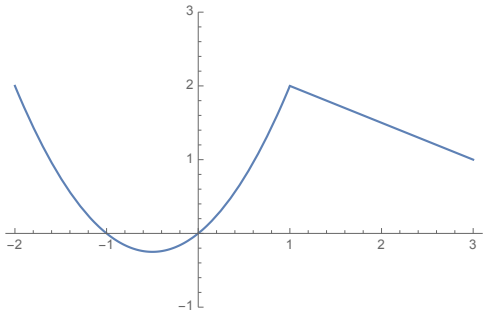
   (b) $\{y : |y + 1| < 5\}$

   (c) $\{t : |t + b| \geq 20\}$

4. Compute the domain and of the following function,

$$f(t) = \frac{t - 1}{t^2\sqrt{t + 3}}$$

For problems 5-7 assume f is the function depicted below.



5. Sketch the function $g(x) = \frac{1}{2}f(x+1) - 1$.

6. What is the domain of f?

7. On what intervals (approximately) is f increasing on? Decreasing on?

8. Consider the function,

$$f(x) = \frac{2x+1}{x-3}$$

and answer the following.

(a) What is the domain of f?

(b) What is f^{-1}?

(c) What is the range of f?

9. Do the points $(1, 2)$, $(3, 5)$ and $(-2, 0)$ lie on the same line?

10. Write the following quadratic function in vertex form,

$$y = 2x^2 + 6x - 3$$

11. Write an equation for a polynomial of degree 3 that has zeros at 1, 2, and 3 and $p(-1) = 1$.