Name: _____ _____ **/ 40**

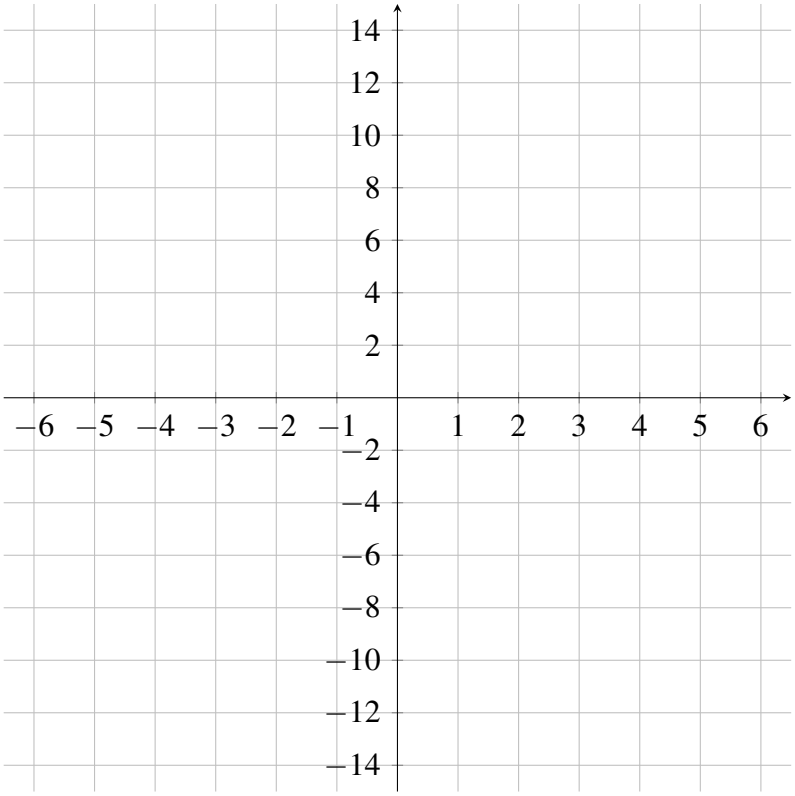
Assessment 3 Instructions:

- The AS-3 is 10 problems and is worth 40 points.
- You will have 1 hour to complete AS-3.
- The AS-3 is closed book and closed notes.
- **Calculators are not allowed** on the AS-3.
- Show all your work for full credit and box your final answer.

1. [4 points] Graph the function

$$f(x) = -\sqrt{x+5} - 2$$

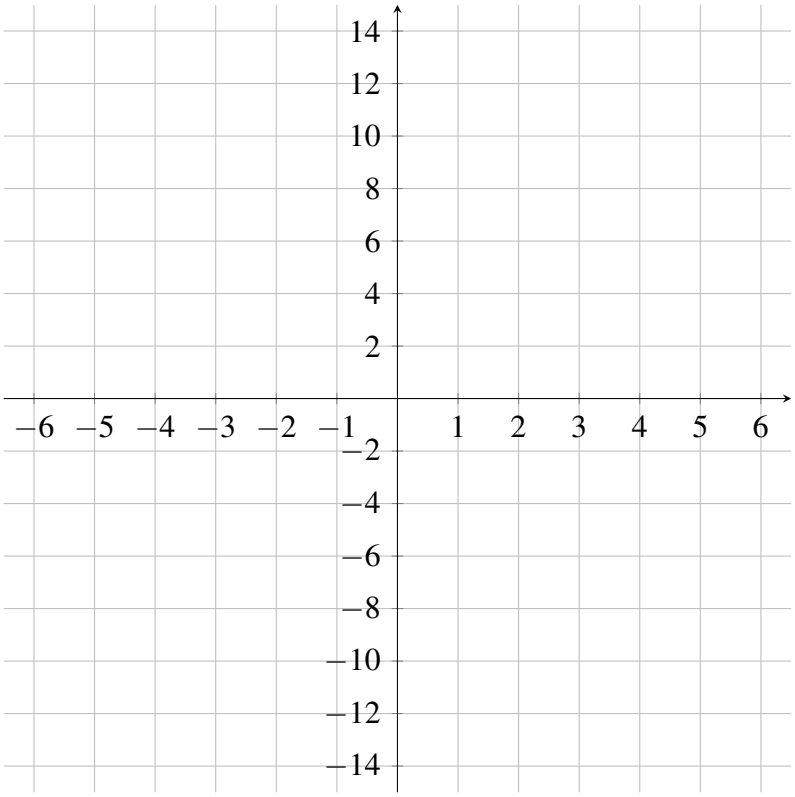
by making the appropriate transformations of a basic curve. State the basic function, the transformations and find all intercepts that exist.



2. [4 points] Graph the function

$$g(x) = 2\,|x-4| + 3$$

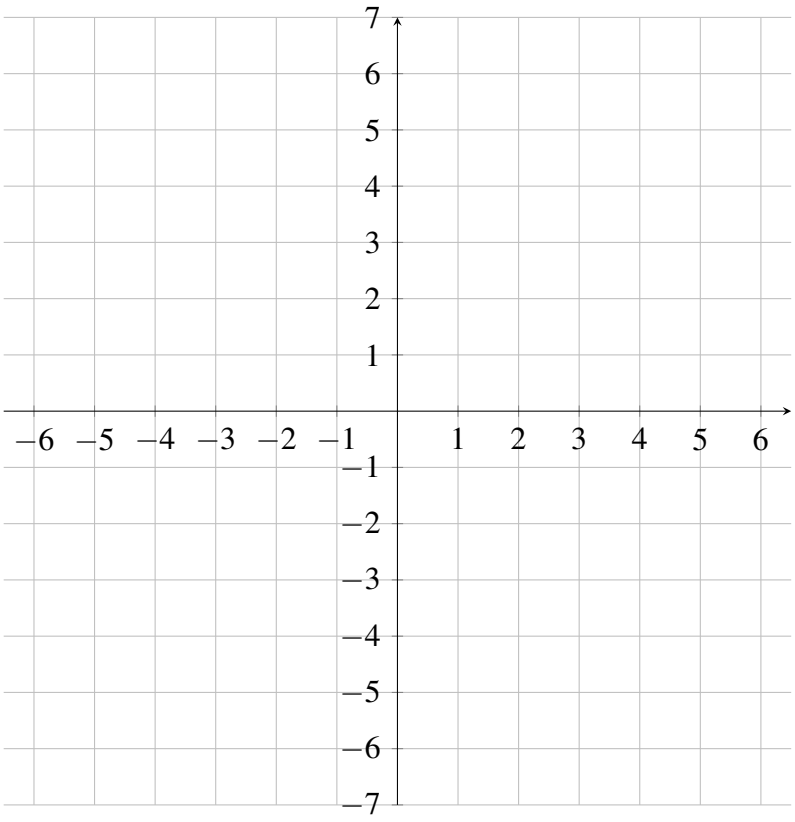
by making the appropriate transformations of a basic curve. State the basic function, the transformations and find all intercepts that exist.



3. [4 points] Graph the function

$$h(x) = \begin{cases} x^2, & -1 \le x \le 1, \\ x+1, & x < -1 \text{ or } x > 1 \end{cases}$$

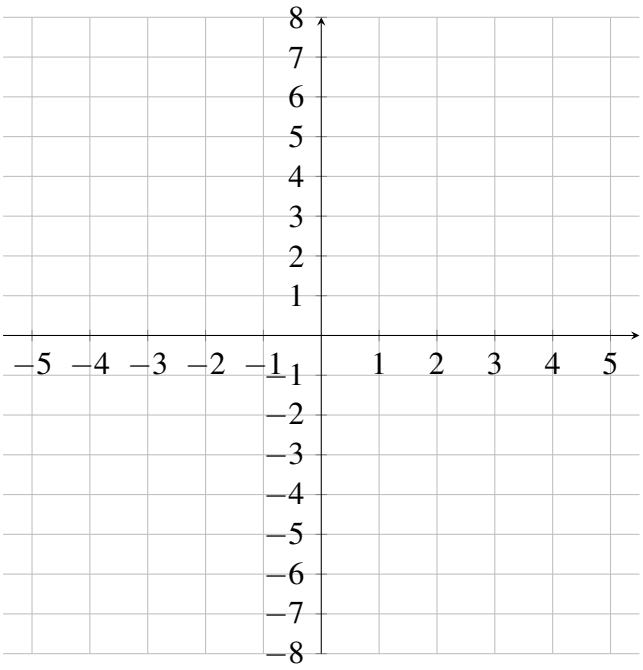
State all intercept points that exist.



4. [4 points]

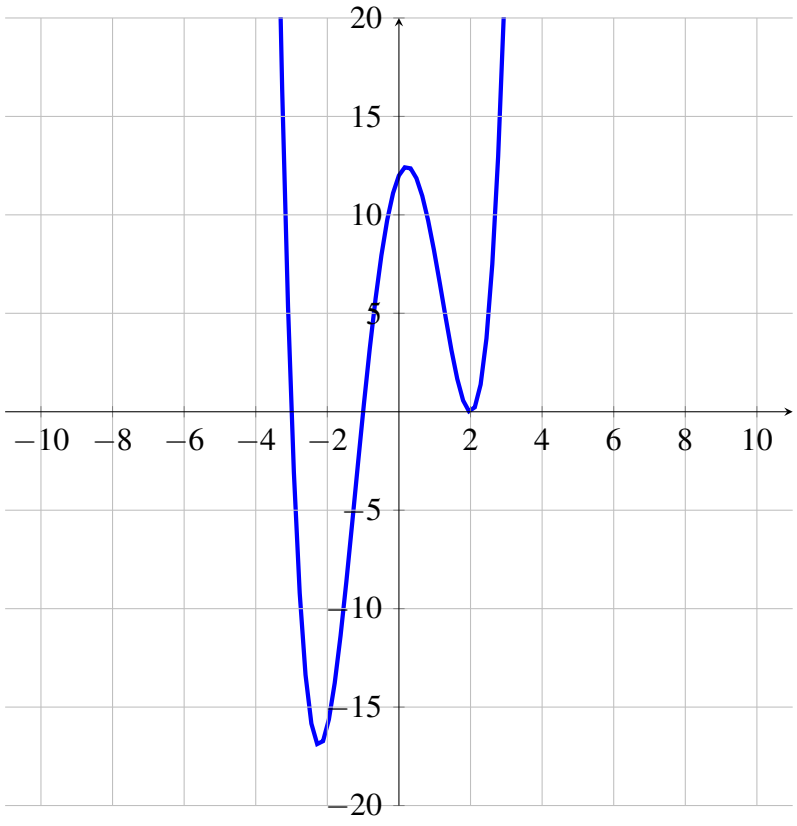
a. Determine if the following relation $F(x) = (x-1)^2 - 2$ is a function.

Hint: sketch a graph and use a Vertical Line Test.



b. If the above relation is a function, then find the open intervals of monotonicity where the function is increasing, decreasing, or constant.

5. [4 points] Using the graph of the function below determine:



a. the locations and types of the local extrema (local min and max)

b. the values of the local extrema

6. [4 points] For the given function determine:

$$f(x) = \frac{3}{x+4}$$

a. domain of f

b. $f(0) =$

c. $\dfrac{f(x+1)-f(x)}{x} =$

7. [4 points] For the given functions

$$g(x) = x^2 - 1, \quad \text{and} \quad h(x) = \sqrt[3]{x}$$

a. find the **formula** $(g+h)(x)$ and **domain** for $f+g$

b. find the **formula** $(g \cdot h)(x) =$

c. find the **formula** $(h \circ g)(x) =$

8. [4 points] For the given relation

$$R = \{(4,2),(3,-1),(-2,-1),(2,4)\}$$

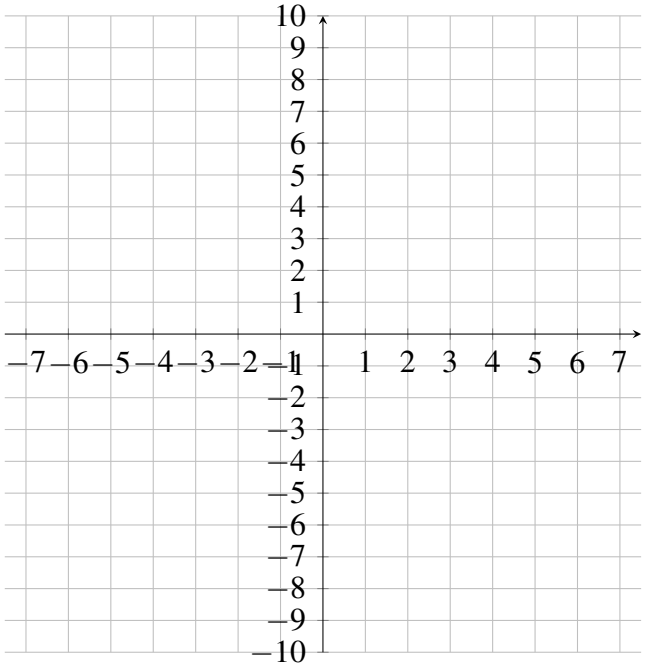
a. find the inverse R^{-1} of the given relation

b. find the domain of the inverse relation R^{-1}

c. find the range of the inverse relation R^{-1}

9. [4 points] Determine if the function $s(x) = \dfrac{1}{x^2}$ has an inverse function $s^{-1}(x)$.

Hint: sketch a graph and use a Horizontal Line Test or use a one-to-one function definition.



10. [4 points] Find a formula for the inverse of the following function

$$f(x) = \sqrt[3]{3x-1}.$$

11. [Extra Credit, 4 points points]

Write a formula for the function described below:

Use the function $g(x) = |x|$. Move the function 7 units to the left, reflect across the x-axis, and reflect across the y-axis.