

1.4b Domain and Range Part 2.

- Find the domain and range by looking only at the equation.
- Become comfortable with using set notation.

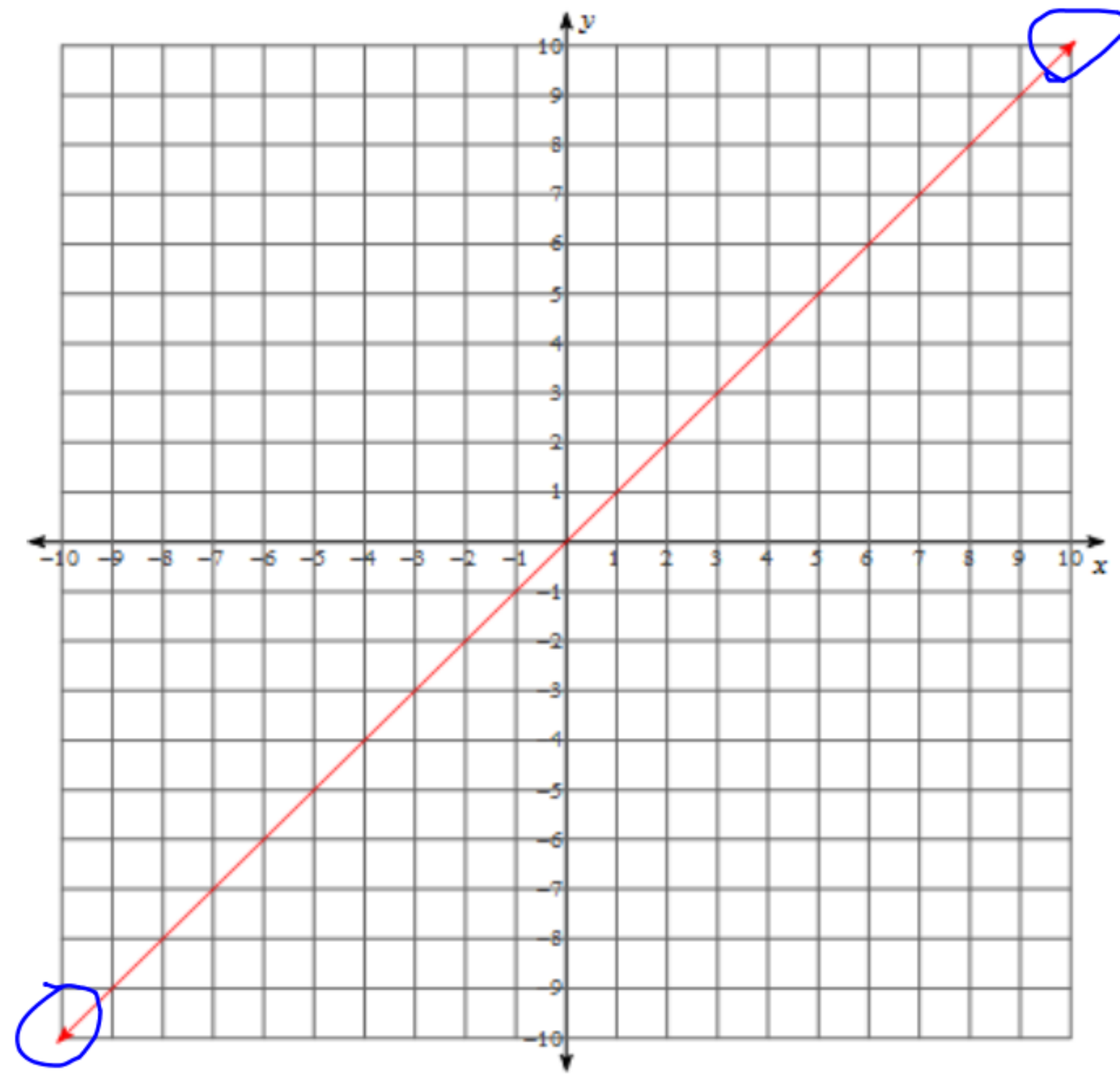
① Linear Functions

$$f(x) = x$$

$$D: \{x \in \mathbb{R}\} \leftarrow \text{everything!}$$

$$R: \{f(x) \in \mathbb{R}\}$$

True for all Linear fns

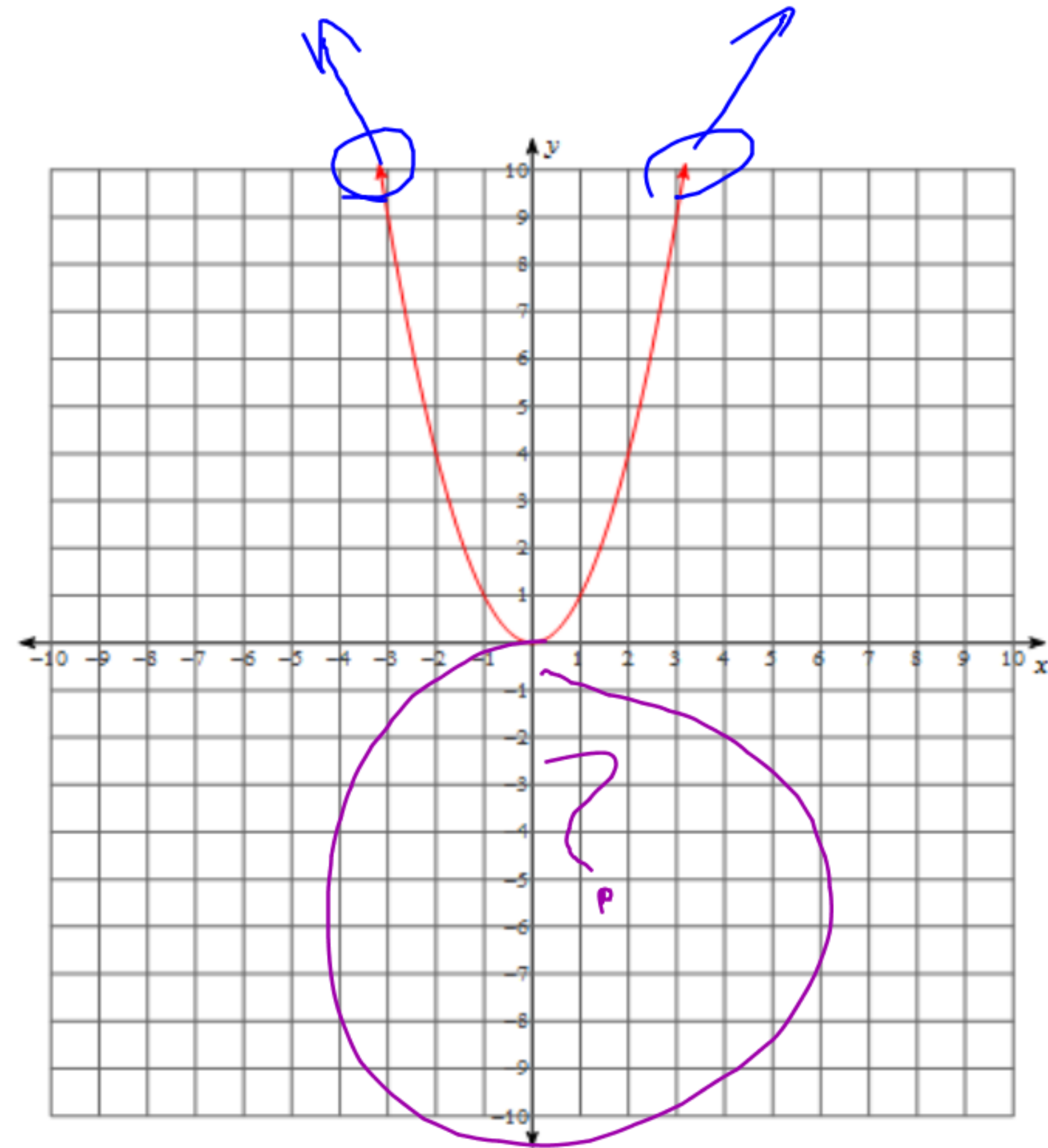


② Quadratz F_{n1}

$$g(x) = x^2$$

$$D: \{x \in \mathbb{R}\}$$

$$R: \{g(x) \in \mathbb{R} \mid g(x) \geq 0\}$$



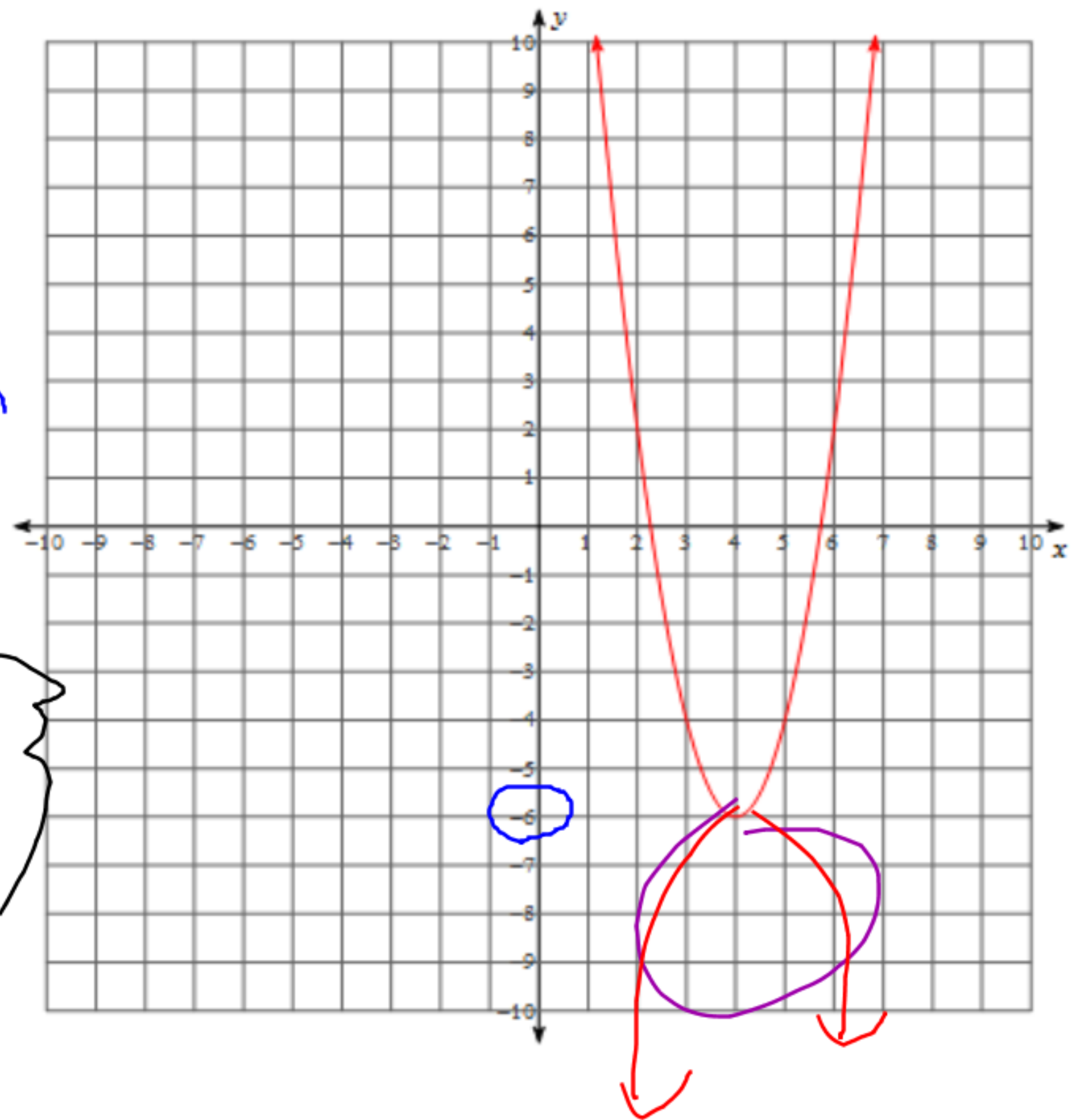
Quadratic, Für example:

$$g(x) = -2(x-4)^2 - 6$$

$$D: \{x \in \mathbb{R}\}$$

V.Sh

$$R: \{g(x) \in \mathbb{R} \mid g(x) \leq -6\}$$

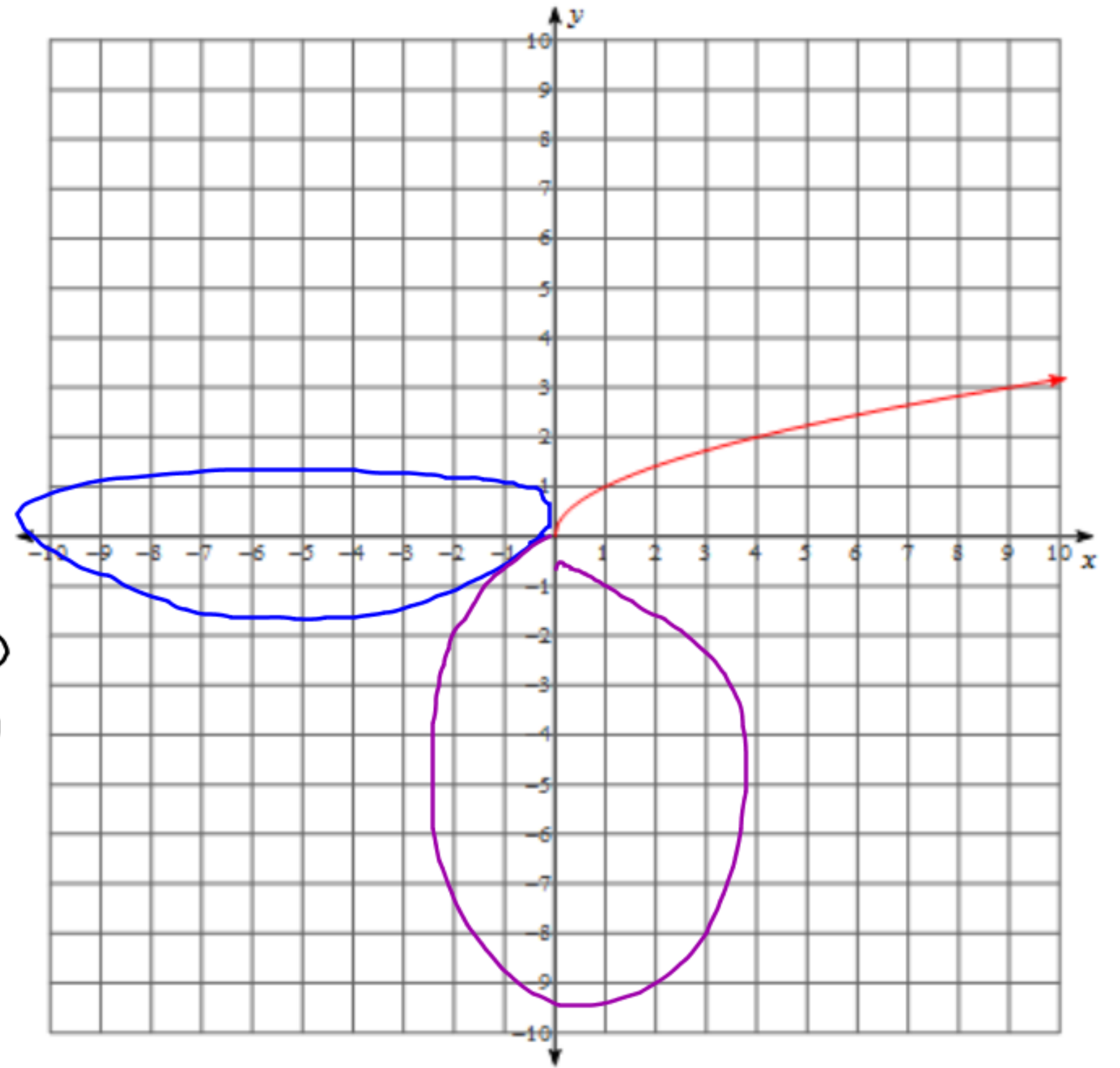


③ Square Root Fun

$$h(x) = \sqrt{x}$$

$$D: \{x \in \mathbb{R} \mid x \geq 0\}$$

$$R: \{h(x) \in \mathbb{R} \mid h(x) \geq 0\}$$



Square Root Example:

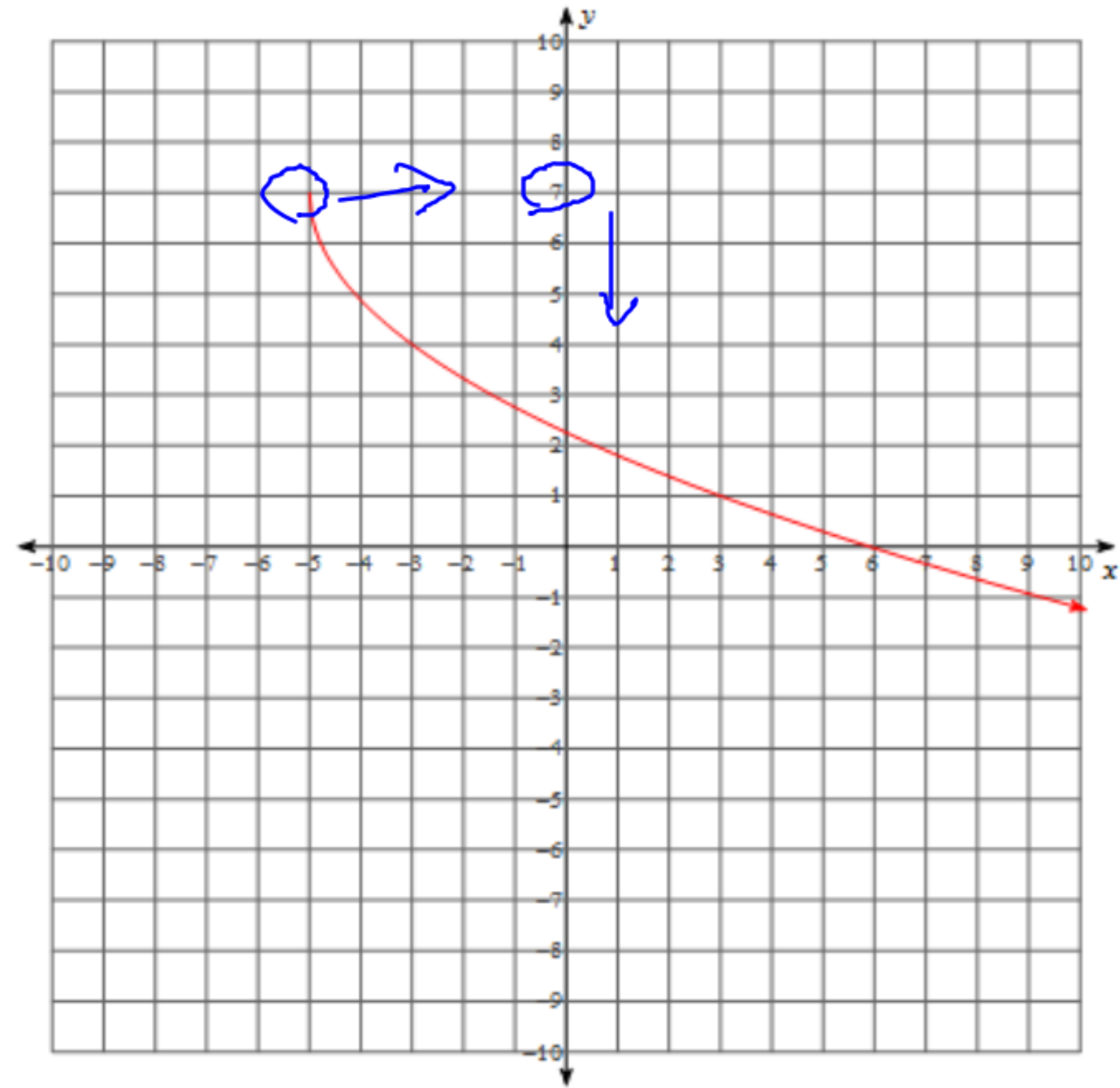
$$h(x) = (-3) \sqrt{-\frac{1}{2}(x+5)} + 7$$

H.S.h

$$D: \{x \in \mathbb{R} \mid x \geq -5\}$$

V.S.h

$$R: \{h(x) \in \mathbb{R} \mid h(x) \leq 7\}$$

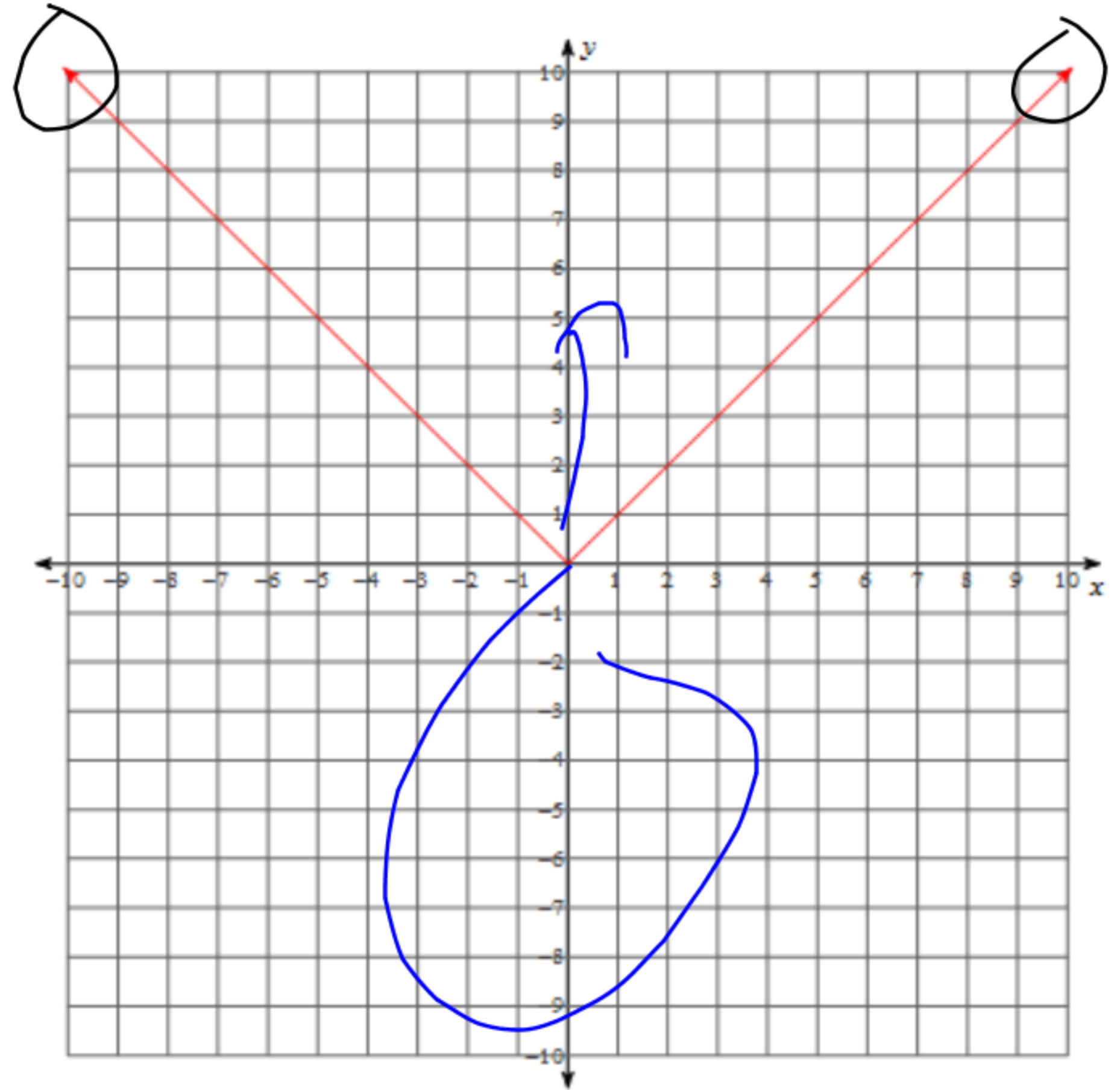


④ Absolute Value F_5

$$K(x) = |x|$$

$$D: \{x \in \mathbb{R}\}$$

$$R: \{K(x) \in \mathbb{R} \mid K(x) \geq 0\}$$

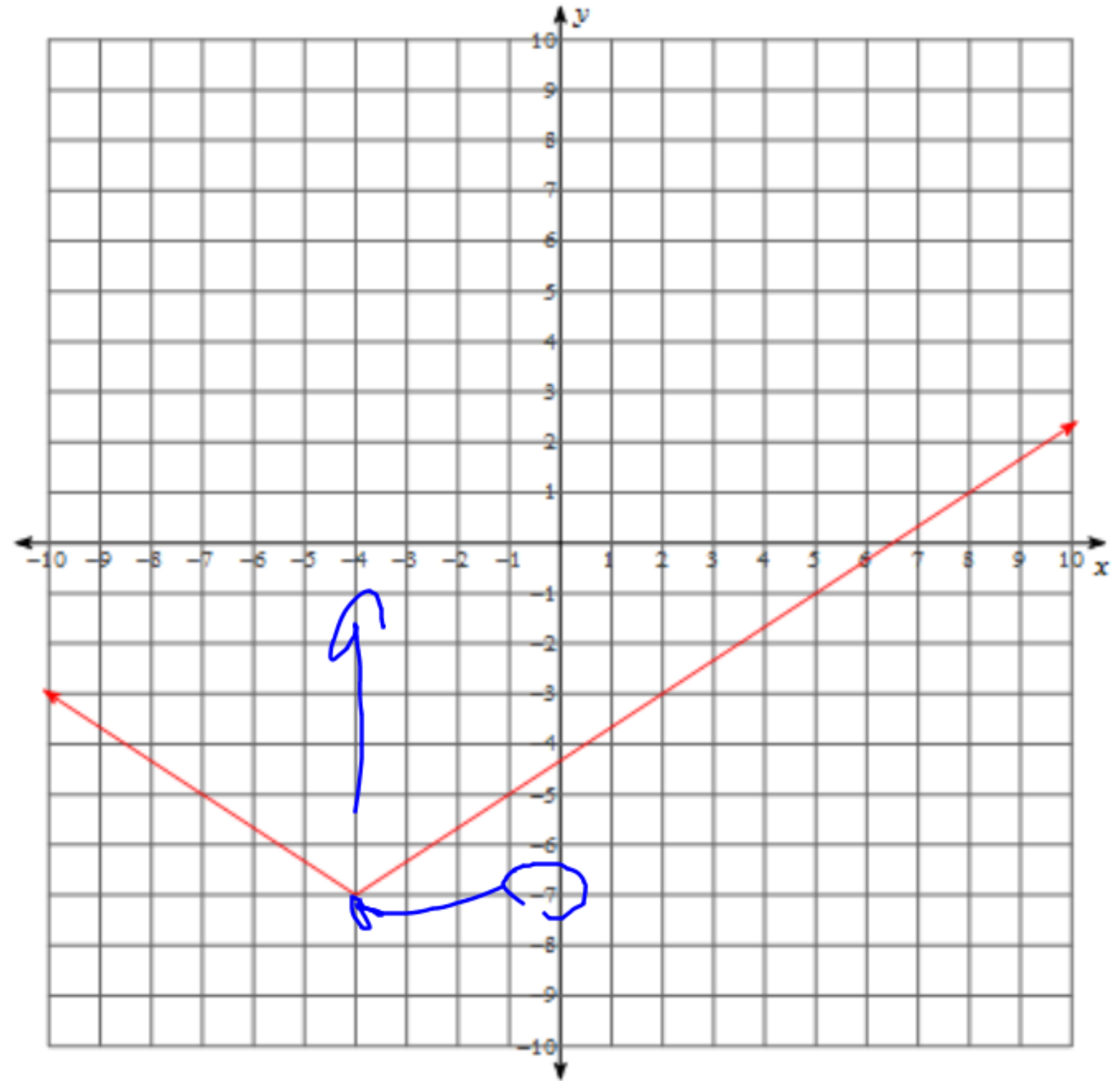


Absolute Value Example

$$h(x) = \frac{1}{3} |2(x+4)| - 7$$

$$D: \{x \in \mathbb{R}\}$$

$$R: \{h(x) \in \mathbb{R} \mid h(x) \geq -7\}$$

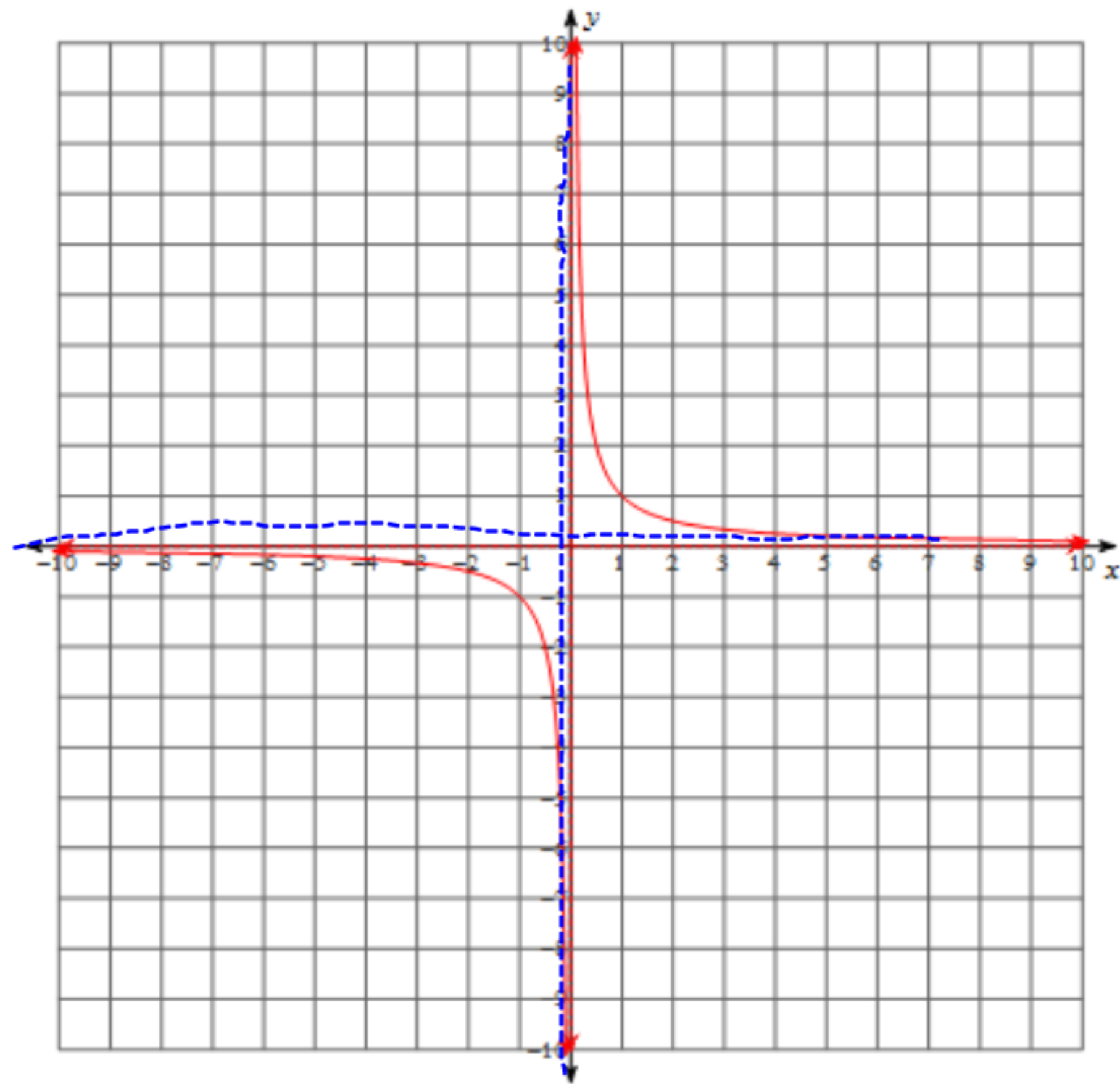


⑤ Reciprocal F_n

$$R(x) = \frac{1}{x}$$

$$D: \{x \in \mathbb{R} \mid x \neq 0\}$$

$$R: \{R(x) \in \mathbb{R} \mid R(x) \neq 0\}$$



Reciprocal Fñ Example

$$R(x) = \frac{-2}{3(x+6)} + 4$$

Note: The fraction $\frac{-2}{3(x+6)}$ is circled in purple, with a purple $\neq 0$ written above it. A green arrow points from the denominator $3(x+6)$ to the text "H.Sh" (Horizontal Shift).

$$D: \{x \in \mathbb{R} \mid x \neq -6\}$$

$$R: \{R(x) \in \mathbb{R} \mid R(x) \neq 4\}$$

