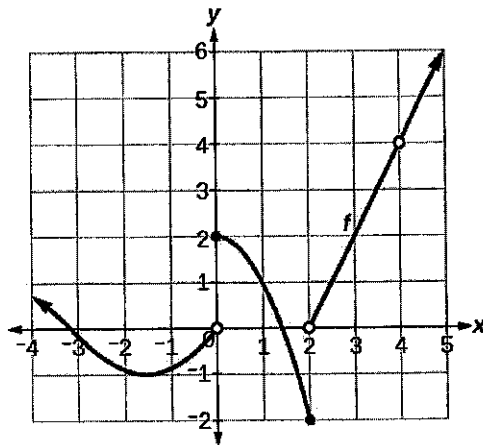


Part 1

Interpreting Graphs

Question 1.1. Find the following limits. Also list all values of x at which the function is not continuous.

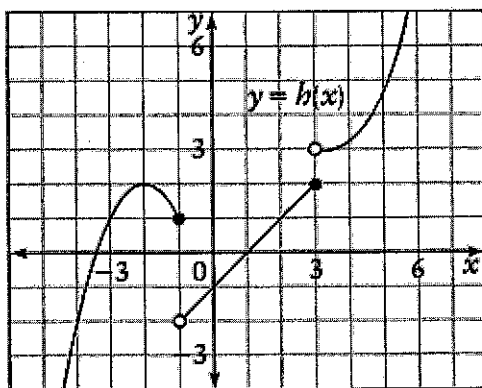
- | | | |
|------------------------------------|------------------------------------|----------------------------------|
| a. $\lim_{x \rightarrow 0^-} f(x)$ | b. $\lim_{x \rightarrow 0^+} f(x)$ | c. $\lim_{x \rightarrow 0} f(x)$ |
| d. $\lim_{x \rightarrow 2^-} f(x)$ | e. $\lim_{x \rightarrow 2^+} f(x)$ | f. $\lim_{x \rightarrow 2} f(x)$ |
| g. $\lim_{x \rightarrow 4^-} f(x)$ | h. $\lim_{x \rightarrow 4^+} f(x)$ | i. $\lim_{x \rightarrow 4} f(x)$ |



- | | | |
|-------|------|-------------------|
| a. 0 | b. 2 | c. Does not exist |
| d. -2 | e. 0 | f. Does not exist |
| g. 4 | h. 4 | i. 4 |

The function is discontinuous at $x=0$, $x=2$, and $x=4$

Question 1.2. Find the following limits. Also list all values of x at which the function is not continuous.



a) $\lim_{x \rightarrow -1^-} h(x) = 1$

b) $\lim_{x \rightarrow -1^+} h(x) = -2$

c) $\lim_{x \rightarrow -1} h(x)$ Does not exist

d) $h(-1) = 1$

e) $\lim_{x \rightarrow 3^-} h(x) = 2$

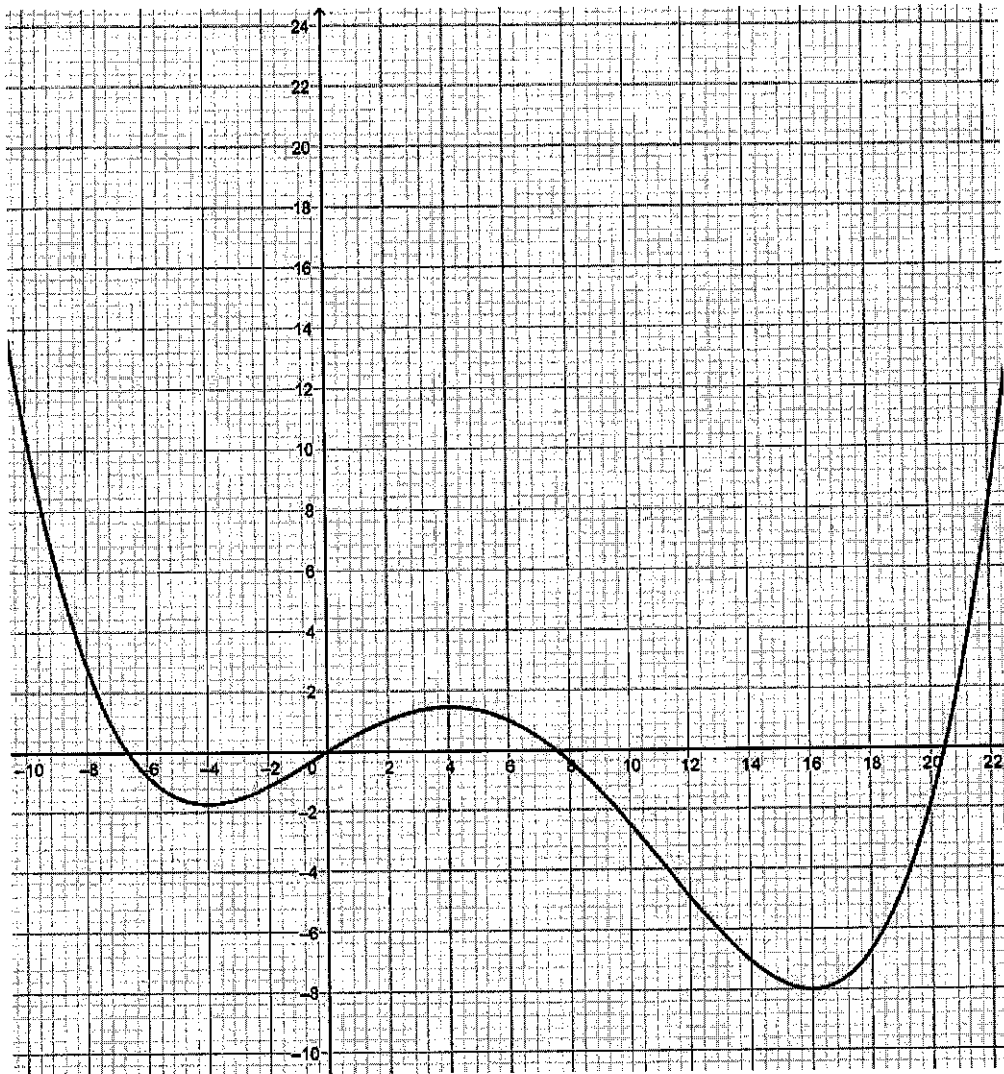
f) $\lim_{x \rightarrow 3^+} h(x) = 3$

g) $\lim_{x \rightarrow 3} h(x)$ Does not exist

h) $h(3) = 2$

The function is discontinuous at $x = -1$ and $x = 3$

Question 1.3. Find the domain and range of the function.

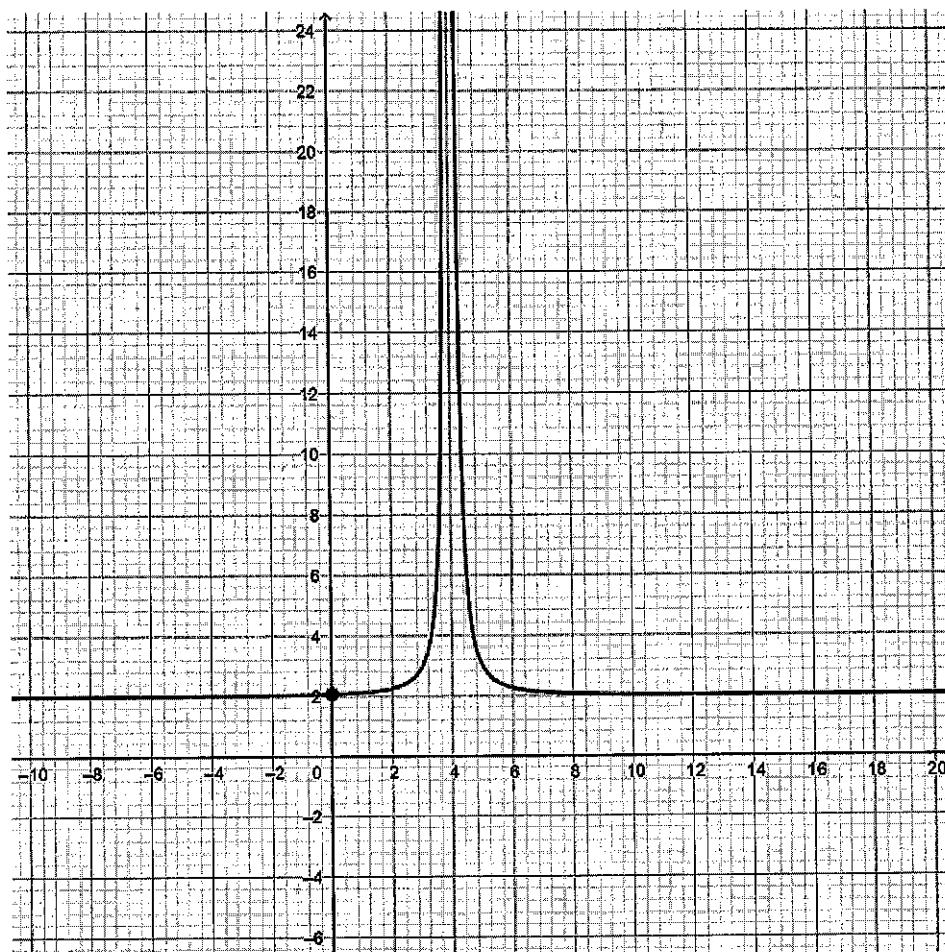


We're probably supposed to assume the left and right parts of the graph go up forever (like a polynomial)

It looks like the domain is $-\infty < x < \infty$
(can keep going to the left or right forever)

and the range is $-8 \leq y < \infty$ (the smallest y value is -8)

Question 1.4. Find the domain and range of the function. Also find the equations of all horizontal or vertical asymptotes.



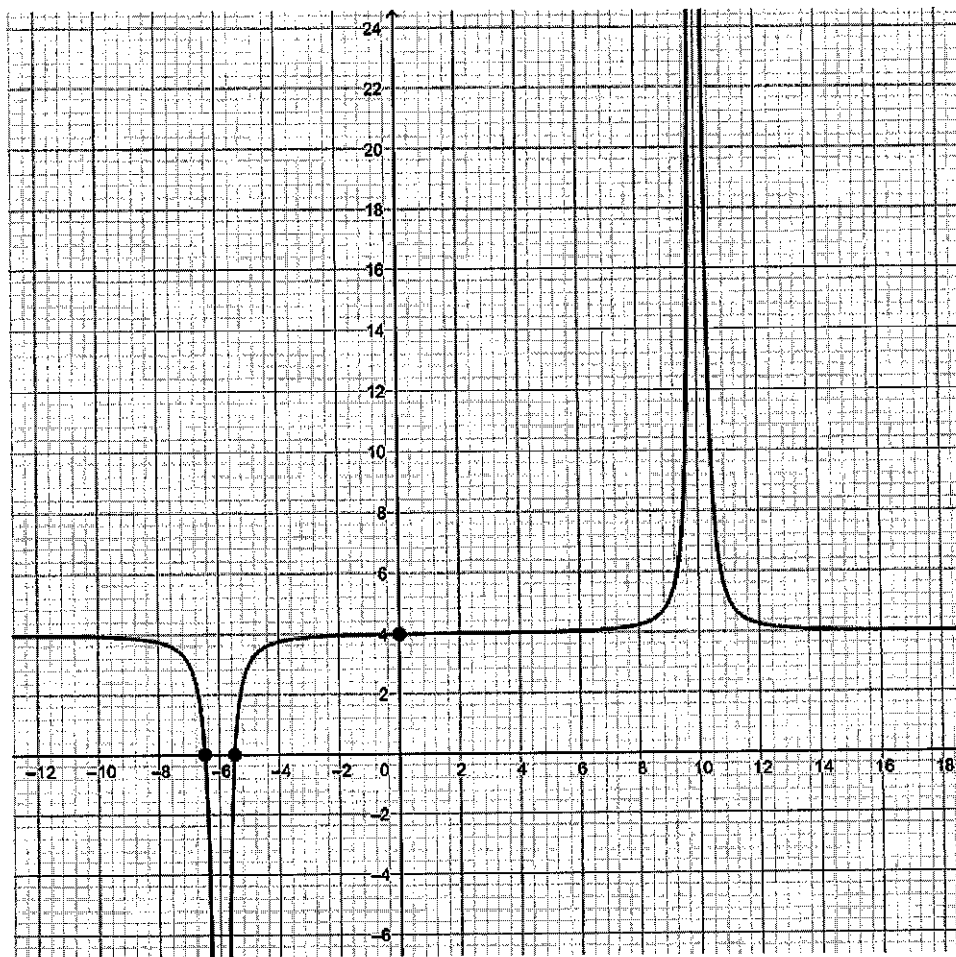
Domain: All x except 4. $(-\infty, 4) \cup (4, \infty)$

Range: All y greater than 2. $(2, \infty)$ or $2 < y < \infty$

Horizontal asymptote: $y = 2$

Vertical asymptote: $x = 4$

Question 1.5. Find the domain and range of the function. Also find the equations of all horizontal or vertical asymptotes.



Domain: All x except -6 and 10 . $(-\infty, -6) \cup (-6, 10) \cup (10, \infty)$

Range: All values of y . $(-\infty, \infty)$

Horizontal asymptote: $y = 4$

Vertical asymptotes: $x = -6$ and $x = 10$