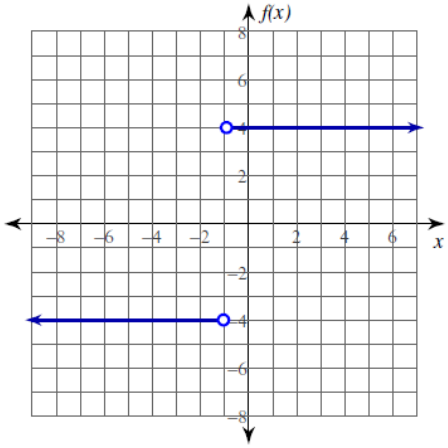
IB MATHEMATICS SL

TOPIC: LIMITS

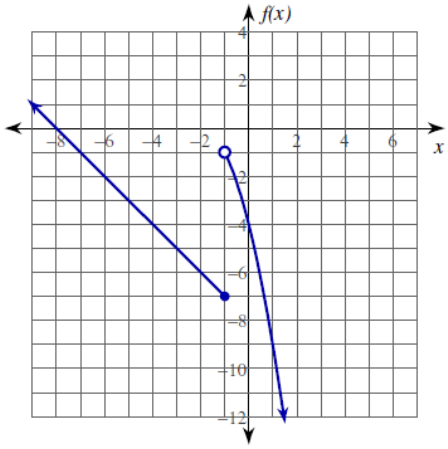
NAME: _____ **DATE:** _____

Evaluate each limit.

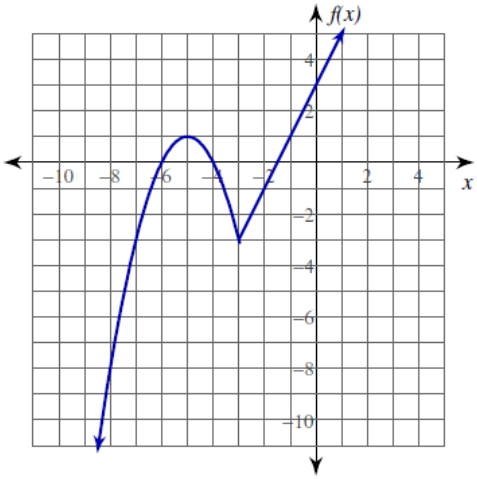
1) $\lim\limits_{x \to -1^+} \dfrac{4x+4}{|x+1|}$



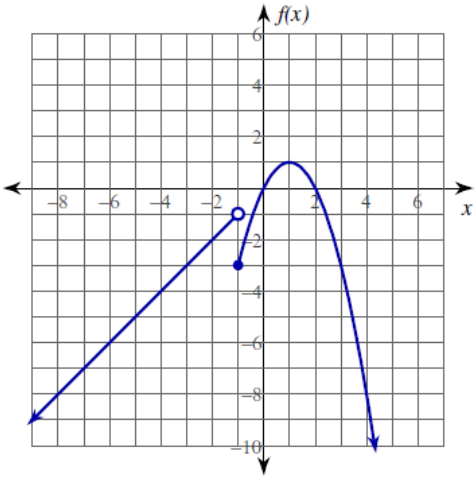
2) $\lim\limits_{x \to -1^-} f(x),\ f(x) = \begin{cases} -x-8, & x \le -1 \\ -x^2-4x-4, & x > -1 \end{cases}$



3) $\lim\limits_{x \to -3} f(x),\ f(x) = \begin{cases} -x^2-10x-24, & x \le -3 \\ 2x+3, & x > -3 \end{cases}$

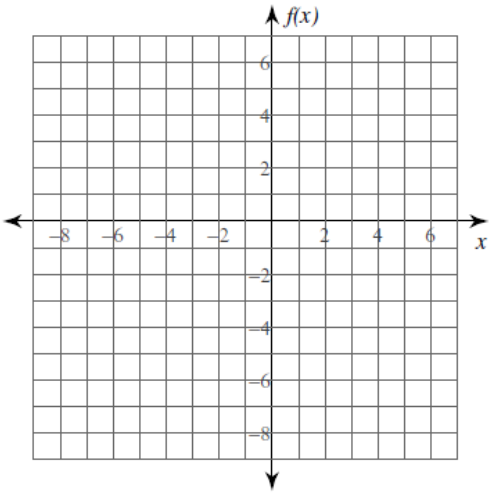


4) $\lim\limits_{x \to -1} f(x),\ f(x) = \begin{cases} x, & x < -1 \\ -x^2+2x, & x \ge -1 \end{cases}$

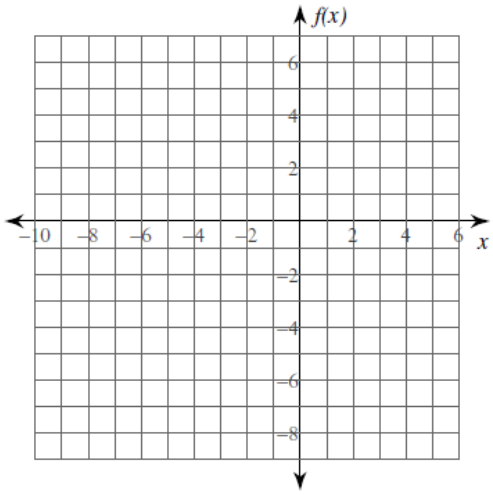


Evaluate each limit. You may use the provided graph to sketch the function.

5) $\lim_{x \to -1^-} f(x),\ f(x) = \begin{cases} -x-3, & x \le -1 \\ x+1, & x > -1 \end{cases}$



6) $\lim_{x \to -2} f(x),\ f(x) = \begin{cases} -x^2-4x-5, & x \le -2 \\ -1, & x > -2 \end{cases}$



Evaluate each limit.

7) $\lim_{x \to 0^+} f(x),\ f(x) = \begin{cases} 1, & x \le 0 \\ -x^2+4x-3, & x > 0 \end{cases}$

8) $\lim_{x \to 0^-} \dfrac{|x|}{x}$

9) $\lim_{x \to 0^+} \lfloor -2x+1 \rfloor$

10) $\lim_{x \to 1} f(x),\ f(x) = \begin{cases} \dfrac{x}{2} + \dfrac{9}{2}, & x < 1 \\ x^2-6x+10, & x \ge 1 \end{cases}$

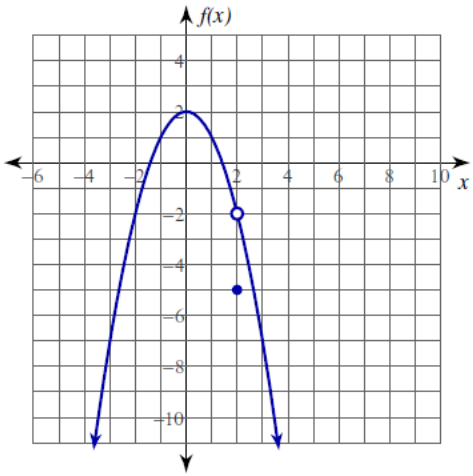
11) $\lim_{x \to -1} \dfrac{3|x+1|}{x+1}$

12) $\lim_{x \to -2} f(x),\ f(x) = \begin{cases} x^2, & x \le -2 \\ -\dfrac{x}{2} + 3, & x > -2 \end{cases}$

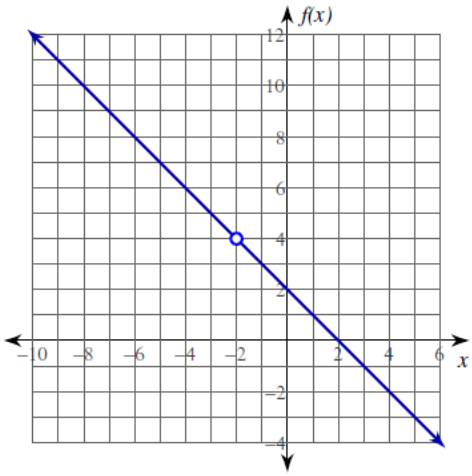
PART II - Complete the following :

Evaluate each limit.

1) $\lim_{x \to 2} f(x),\ f(x) = \begin{cases} -x^2 + 2, & x \neq 2 \\ -5, & x = 2 \end{cases}$

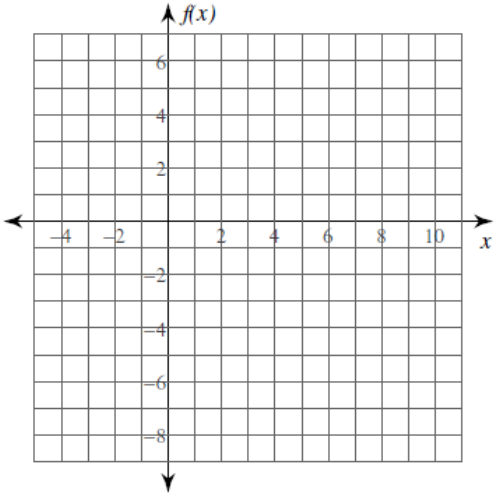


2) $\lim_{x \to -2} -\dfrac{x^2 - 4}{x + 2}$

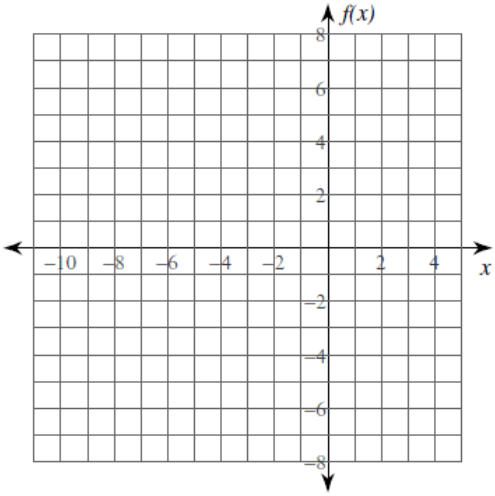


Evaluate each limit. You may use the provided graph to sketch the function.

3) $\lim_{x \to 3} \dfrac{x^2 - 7x + 12}{x - 3}$



4) $\lim_{x \to -3} \dfrac{x + 3}{x^2 + 2x - 3}$



Evaluate each limit.

5) $\lim_{x \to 0} f(x),\ f(x) = \begin{cases} x+1, & x \neq 0 \\ 2, & x = 0 \end{cases}$

6) $\lim_{x \to 3} f(x),\ f(x) = \begin{cases} 2 + \frac{x}{2}, & x \neq 3 \\ 2, & x = 3 \end{cases}$

7) $\lim_{x \to 1} -\frac{x^2 - 1}{x - 1}$

8) $\lim_{x \to 5} -\frac{x^2 - 5x}{x - 5}$

9) $\lim_{x \to 2} -\frac{x^2 - x - 2}{x - 2}$

10) $\lim_{x \to -5} \frac{x^2 + 3x - 10}{x + 5}$

11) $\lim_{x \to 0} \frac{\frac{1}{-4 + x} + \frac{1}{4}}{x}$

12) $\lim_{x \to -3} \frac{x}{\frac{1}{3 + x} - \frac{1}{3}}$

13) $\lim_{x \to 5} \frac{x - 5}{\sqrt{x + 4} - 3}$

14) $\lim_{x \to 3} \frac{\sqrt{x + 6} - 3}{x - 3}$