

TAREA 3 – 2

En los ejercicios 1 al 22, dibuje la gráfica de la función y si existe, determine el límite indicado; si el límite no existe, diga por qué razón.

$$1. f(x) = \begin{cases} 2 & \text{si } x < 1 \\ -1 & \text{si } x = 1 \\ -3 & \text{si } x > 1 \end{cases}$$

(a) $\lim_{x \rightarrow 1^+} f(x)$; (b) $\lim_{x \rightarrow 1^-} f(x)$; (c) $\lim_{x \rightarrow 1} f(x)$

$$3. f(t) = \begin{cases} t+4 & \text{si } t \leq -4 \\ 4-t & \text{si } t > -4 \end{cases}$$

(a) $\lim_{t \rightarrow -4^+} f(t)$; (b) $\lim_{t \rightarrow -4^-} f(t)$; (c) $\lim_{t \rightarrow -4} f(t)$

$$5. F(x) = \begin{cases} x^2 & \text{si } x \leq 2 \\ 8-2x & \text{si } x > 2 \end{cases}$$

(a) $\lim_{x \rightarrow 2^+} F(x)$; (b) $\lim_{x \rightarrow 2^-} F(x)$; (c) $\lim_{x \rightarrow 2} F(x)$

$$7. g(r) = \begin{cases} 2r & \text{si } r < 1 \\ 2 & \text{si } r = 1 \\ 7-2r & \text{si } r > 1 \end{cases}$$

(a) $\lim_{r \rightarrow 1^+} g(r)$; (b) $\lim_{r \rightarrow 1^-} g(r)$; (c) $\lim_{r \rightarrow 1} g(r)$

$$9. f(x) = \begin{cases} x^2-4 & \text{si } x < 2 \\ 4 & \text{si } x = 2 \\ 4-x^2 & \text{si } x > 2 \end{cases}$$

(a) $\lim_{x \rightarrow 2^+} f(x)$; (b) $\lim_{x \rightarrow 2^-} f(x)$; (c) $\lim_{x \rightarrow 2} f(x)$

$$11. F(x) = |x-5|$$

(a) $\lim_{x \rightarrow 5^+} F(x)$; (b) $\lim_{x \rightarrow 5^-} F(x)$; (c) $\lim_{x \rightarrow 5} F(x)$

$$13. G(x) = |2x-3| - 4$$

(a) $\lim_{x \rightarrow \frac{3}{2}^+} G(x)$; (b) $\lim_{x \rightarrow \frac{3}{2}^-} G(x)$; (c) $\lim_{x \rightarrow \frac{3}{2}} G(x)$

$$15. f(x) = \frac{|x|}{x}$$

(a) $\lim_{x \rightarrow 0^+} f(x)$; (b) $\lim_{x \rightarrow 0^-} f(x)$; (c) $\lim_{x \rightarrow 0} f(x)$

$$2. f(x) = \begin{cases} -2 & \text{si } x < 0 \\ 2 & \text{si } x \geq 0 \end{cases}$$

(a) $\lim_{x \rightarrow 0^+} f(x)$; (b) $\lim_{x \rightarrow 0^-} f(x)$; (c) $\lim_{x \rightarrow 0} f(x)$

$$4. g(s) = \begin{cases} s+3 & \text{si } s \leq -2 \\ 3-s & \text{si } s > -2 \end{cases}$$

(a) $\lim_{s \rightarrow -2^+} g(s)$; (b) $\lim_{s \rightarrow -2^-} g(s)$; (c) $\lim_{s \rightarrow -2} g(s)$

$$6. h(x) = \begin{cases} 2x+1 & \text{si } x \leq 3 \\ 10-x & \text{si } x > 3 \end{cases}$$

(a) $\lim_{x \rightarrow 3^+} h(x)$; (b) $\lim_{x \rightarrow 3^-} h(x)$; (c) $\lim_{x \rightarrow 3} h(x)$

$$8. g(t) = \begin{cases} 3+t^2 & \text{si } t < -2 \\ 0 & \text{si } t = -2 \\ 11-t^2 & \text{si } t > -2 \end{cases}$$

(a) $\lim_{t \rightarrow -2^+} g(t)$; (b) $\lim_{t \rightarrow -2^-} g(t)$; (c) $\lim_{t \rightarrow -2} g(t)$

$$10. f(x) = \begin{cases} 2x+3 & \text{si } x < 1 \\ 4 & \text{si } x = 1 \\ x^2+2 & \text{si } x > 1 \end{cases}$$

(a) $\lim_{x \rightarrow 1^+} f(x)$; (b) $\lim_{x \rightarrow 1^-} f(x)$; (c) $\lim_{x \rightarrow 1} f(x)$

$$12. f(x) = 3 + |2x-4|$$

(a) $\lim_{x \rightarrow 2^+} f(x)$; (b) $\lim_{x \rightarrow 2^-} f(x)$; (c) $\lim_{x \rightarrow 2} f(x)$

$$14. F(x) = \begin{cases} |x-1| & \text{si } x < -1 \\ 0 & \text{si } x = -1 \\ |1-x| & \text{si } x > -1 \end{cases}$$

(a) $\lim_{x \rightarrow -1^+} F(x)$; (b) $\lim_{x \rightarrow -1^-} F(x)$; (c) $\lim_{x \rightarrow -1} F(x)$

$$16. S(x) = |\operatorname{sgn} x|. \text{ Donde: } \operatorname{sgn} x = \begin{cases} -1 & \text{si } x < 0 \\ 0 & \text{si } x = 0 \\ 1 & \text{si } x > 0 \end{cases}$$

(a) $\lim_{x \rightarrow 0^+} S(x)$; (b) $\lim_{x \rightarrow 0^-} S(x)$; (c) $\lim_{x \rightarrow 0} S(x)$

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$$17. f(x) = \begin{cases} 2 & \text{si } x < -2 \\ \sqrt{4-x^2} & \text{si } -2 \leq x \leq 2 \\ -2 & \text{si } x > 2 \end{cases}$$

- (a) $\lim_{x \rightarrow -2^+} f(x)$; (b) $\lim_{x \rightarrow -2^-} f(x)$; (c) $\lim_{x \rightarrow -2} f(x)$;
 (d) $\lim_{x \rightarrow 2^-} f(x)$; (e) $\lim_{x \rightarrow 2^+} f(x)$; (f) $\lim_{x \rightarrow 2} f(x)$

$$19. f(t) = \begin{cases} \sqrt[3]{t} & \text{si } t < 0 \\ \sqrt{t} & \text{si } t \geq 0 \end{cases}$$

- (a) $\lim_{t \rightarrow 0^+} f(t)$; (b) $\lim_{t \rightarrow 0^-} f(t)$; (c) $\lim_{t \rightarrow 0} f(t)$

$$21. F(x) = \begin{cases} \sqrt{x^2-9} & \text{si } x \leq -3 \\ \sqrt{9-x^2} & \text{si } -3 < x < 3 \\ \sqrt{x^2-9} & \text{si } x \geq 3 \end{cases}$$

- (a) $\lim_{x \rightarrow -3^-} F(x)$; (b) $\lim_{x \rightarrow -3^+} F(x)$; (c) $\lim_{x \rightarrow -3} F(x)$;
 (d) $\lim_{x \rightarrow 3^-} F(x)$; (e) $\lim_{x \rightarrow 3^+} F(x)$; (f) $\lim_{x \rightarrow 3} F(x)$

$$18. f(x) = \begin{cases} x+1 & \text{si } x < -1 \\ x^2 & \text{si } -1 \leq x \leq 1 \\ 2-x & \text{si } x > 1 \end{cases}$$

- (a) $\lim_{x \rightarrow -1^-} f(x)$; (b) $\lim_{x \rightarrow -1^+} f(x)$; (c) $\lim_{x \rightarrow -1} f(x)$;
 (d) $\lim_{x \rightarrow 1^-} f(x)$; (e) $\lim_{x \rightarrow 1^+} f(x)$; (f) $\lim_{x \rightarrow 1} f(x)$

$$20. g(x) = \begin{cases} \sqrt[3]{-x} & \text{si } x \leq 0 \\ \sqrt[3]{x} & \text{si } x > 0 \end{cases}$$

- (a) $\lim_{x \rightarrow 0^+} g(x)$; (b) $\lim_{x \rightarrow 0^-} g(x)$; (c) $\lim_{x \rightarrow 0} g(x)$

$$22. G(t) = \begin{cases} \sqrt[3]{t+1} & \text{si } t \leq -1 \\ \sqrt{1-t^2} & \text{si } -1 < t < 1 \\ \sqrt[3]{t-1} & \text{si } t \geq 1 \end{cases}$$

- (a) $\lim_{t \rightarrow -1^-} G(t)$; (b) $\lim_{t \rightarrow -1^+} G(t)$; (c) $\lim_{t \rightarrow -1} G(t)$;
 (d) $\lim_{t \rightarrow 1^-} G(t)$; (e) $\lim_{t \rightarrow 1^+} G(t)$; (f) $\lim_{t \rightarrow 1} G(t)$