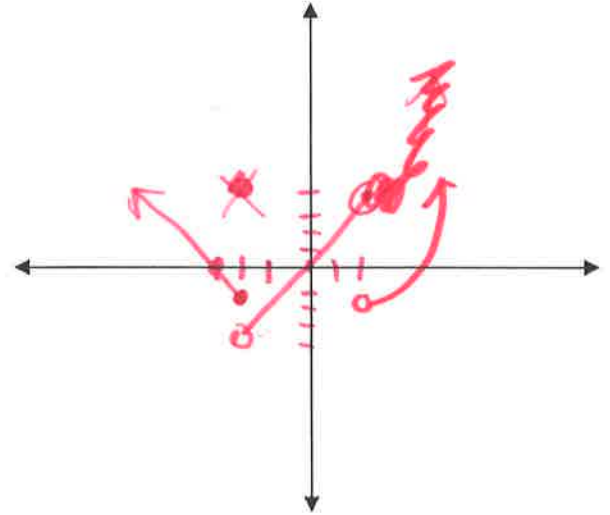


Find the requested limits for the piecewise functions. Draw a sketch of the graph.

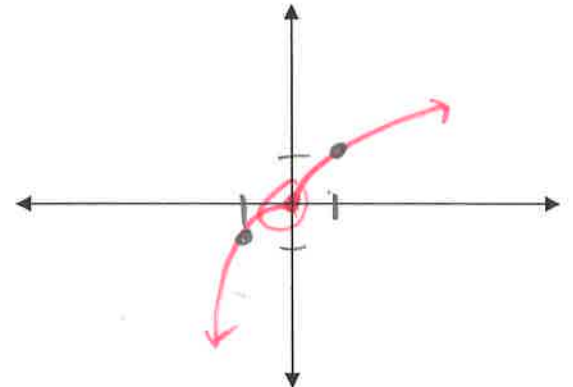
$$1. g(x) = \begin{cases} -3-x & \text{if } x \leq -2 \\ 2x & \text{if } -2 < x \leq 2 \\ x^2 - 4x + 3 & \text{if } x > 2 \end{cases}$$

$g(5) = 1$ $g(-2) = -1$ $g(2) = 4$
 $\lim_{x \rightarrow 5^-} g(x) = 1$ $\lim_{x \rightarrow 5^+} g(x) = 1$ $\lim_{x \rightarrow 5} g(x) = 1$
 $\lim_{x \rightarrow -2^-} g(x) = -1$ $\lim_{x \rightarrow -2^+} g(x) = -4$ $\lim_{x \rightarrow -2} g(x) = \text{DNE}$
 $\lim_{x \rightarrow 2^-} g(x) = 4$ $\lim_{x \rightarrow 2^+} g(x) = -1$ $\lim_{x \rightarrow 2} g(x) = \text{DNE}$
 $\lim_{x \rightarrow \infty} g(x) = \infty$ $\lim_{x \rightarrow -\infty} g(x) = \infty$



$$2. h(x) = \begin{cases} x^3 & x < 0 \\ \sqrt{x} & x \geq 0 \end{cases}$$

$\lim_{x \rightarrow 1} h(x) = 1$ $\lim_{x \rightarrow -3} h(x) = -27$ $\lim_{x \rightarrow 0} h(x) = 0$
 $\lim_{x \rightarrow -\infty} h(x) = -\infty$ $\lim_{x \rightarrow \infty} h(x) = \infty$



Determine the following limits. If a calculator was used, write "calc" and explain how it was used.

3. $\lim_{x \rightarrow \infty} \frac{\sqrt{5x^2 + 3x}}{2x - 1} = \frac{\sqrt{5}}{2}$

4. $\lim_{x \rightarrow \infty} 5^x = \infty$

5. $\lim_{x \rightarrow 4} \frac{1}{x - 4} = \text{DNE}$

6. $\lim_{x \rightarrow \infty} 3^{-x} = 0$

7. $\lim_{x \rightarrow -3^+} \frac{x+2}{x+3} = -\infty$

8. $\lim_{x \rightarrow \infty} \left(\frac{1}{4}\right)^x = 0$

9. $\lim_{x \rightarrow -\infty} \frac{x^3 - 4x + 2}{x - 5} = \infty$ (Handwritten: $\frac{-\infty^3}{-\infty} = \infty^2$)

10. $\lim_{x \rightarrow \infty} 6^x = \infty$ (Handwritten: $6^{-\infty} = \frac{1}{6^{\infty}}$)

11. $\lim_{x \rightarrow \infty} \frac{5x + 2}{x^2 - 4x + 1} = 0$

12. $\lim_{x \rightarrow \infty} \frac{3x + 1}{\sqrt{2x^2 - 3x + 7}} = \frac{3}{\sqrt{2}}$ (Handwritten: $\frac{3}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$)

13. $\lim_{x \rightarrow 2^+} \frac{3}{x - 2} = \infty$

14. $\lim_{x \rightarrow \infty} \frac{x + 4}{\sqrt{2x^3 - 5x}} = 0$ (Handwritten: $\frac{\infty}{\sqrt{\infty^3}} = \frac{\infty}{\infty^{1.5}} = \frac{1}{\infty^{0.5}}$)

15. $\lim_{x \rightarrow \infty} \frac{\sqrt{3x^2}}{x} = \frac{\sqrt{3}}{1}$ (Handwritten: $\frac{\sqrt{(\infty)^2}}{\infty} = \frac{\infty}{\infty} = \sqrt{3}$)

16. $\lim_{x \rightarrow -\infty} \frac{3x^5 + 1}{x^4} = -\infty$ (Handwritten: $\frac{3(-\infty)^5}{(-\infty)^4} = \frac{-\infty}{\infty} = -\infty$)

17. $\lim_{x \rightarrow \infty} \frac{1}{2}x + 7 = \infty$