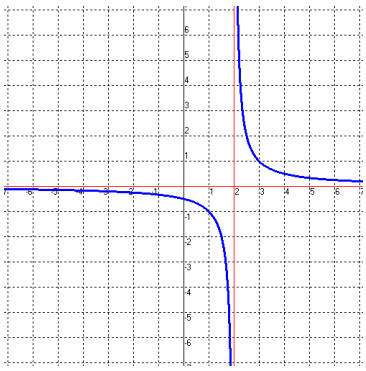
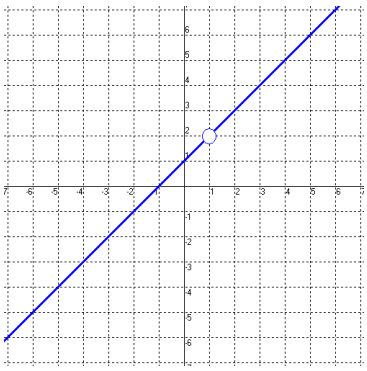
Piecewise and Limits Test Review

Use the graphs to find the limits if they exist. If not, write DNE.

1. $\lim_{x\to 2}\frac{1}{x-2}=$ $\lim_{x\to -1}\frac{1}{x-2}=$



2. $\lim_{x\to 1}\frac{x^2-1}{x-1}=$ $\lim_{x\to -5}\frac{x^2-1}{x-1}=$ $\lim_{x\to 0}\frac{x^2-1}{x-1}=$



Find the limit, if it exists.

3. $\lim_{x\to 4}\left(\frac{1}{2}x+3\right)$

4. $\lim_{x\to 3}\frac{|x-3|}{x-3}$

5. $\lim_{x\to -1}\frac{\frac{1}{x+2}-1}{x+1}$

6. $\lim_{x\to -3}\left(x^3-6x^2+3x-1\right)$

7. $\lim_{x\to 5}\frac{x-5}{x^2+5x-50}$

8. $\lim_{x\to 0}\frac{\sqrt{x+4}-2}{x}$

9. $\lim_{x\to \infty}\frac{4x}{2x-3}$

10. $\lim_{x\to 2} f(x)$ where $f(x)=\begin{cases}5-x, & x\le 2\\ x^2-3, & x>2\end{cases}$

11. $\lim_{x\to \infty}\frac{x^2}{2x+3}$

12. $\lim_{x\to -2}\frac{x^3-2x^2-x+14}{x+2}$

13. $\lim_{x\to \frac{3\pi}{4}}\csc x$

14. $\lim_{x\to \frac{\pi}{2}}\tan x$

15. $\lim_{x\to -\infty}\sin x$

16. $\lim_{x\to -\infty}\frac{x^2+3}{5x^2-4}$

17. $\lim_{x\to \infty}\sqrt{\frac{4x^2-3x+2}{5x^2-6}}$

18. $\lim_{x\to \infty}\frac{-x^2}{2x^3+3}$

19. $\lim_{x\to 5}\frac{x^3 - 125}{x - 5}$ 20. $\lim_{x\to\infty}\left[\frac{x}{2x+1}+\frac{3x^2}{(x-3)^2}\right]$ 21. $\lim_{x\to 16}\frac{\sqrt{x}-4}{x-16}$ 22. $\lim_{x\to\infty}\sqrt{\frac{x+4}{x^2-6x+3}}$

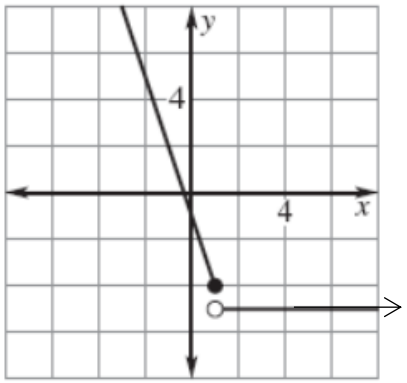
Evaluate the function for the given value of x.

$f(x)=\begin{cases}3, if\ x\ \le 0\\ 2, if\ x\ > 0\end{cases}$ $g(x)=\begin{cases}x+5, if\ x\ \le 3\\ 2x-1, if\ x\ > 3\end{cases}$ $h(x)=\begin{cases}\frac{1}{2}x-4, if\ x\ \le -2\\ 3-2x, if\ x\ > -2\end{cases}$

23. f(0) 24. f($\frac{1}{2}$) 25. g(-1) 26. g(3) 27. h(-2) 28. h(6)

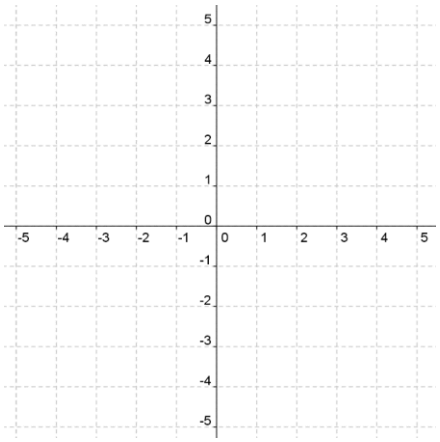
29. Write a piecewise function for the following graph.

(notice increments on the axis)



Graph the following.

30. f(x) = $\begin{cases}x+3, if\ x\ \le 0\\ 2x, if\ x\ > 0\end{cases}$



31. f(x) = $\begin{cases}x+1, if\ x\ < 0\\ -x+1, if\ 0\ \le x\ \le 2\\ x-1, if\ x\ > 2\end{cases}$