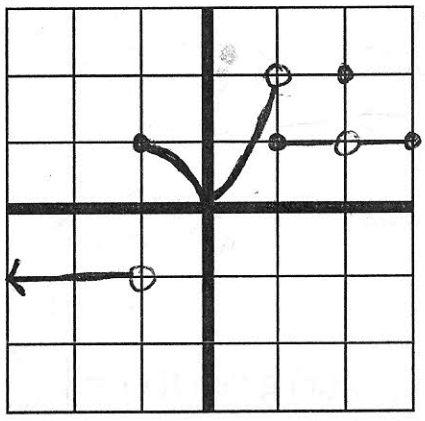
No Calculator

NAME_____

Chapter 2 Quiz Review

1. Use the graph to find the limits.



   a. $\lim_{x\to -1^+} g(x) = 1$
   b. $\lim_{x\to 2} g(x) = 1$
   c. $\lim_{x\to 1^+} g(x) = 1$
   d. $\lim_{x\to 0^+} g(x) = 0$
   e. $\lim_{x\to 0^-} g(x) = 0$
   f. $\lim_{x\to 1^-} g(x) = 2$
   g. $\lim_{x\to 0} g(x) = 0$
   h. $g(-1) = 1$
   i. $g(0) = 0$

Determine the limit if it exists.

2. $\lim_{x\to -2}(5x^2 + 4x - 2) = 5(-2)^2 + 4(-2) - 2 = 5(4) - 8 - 2 = 20 - 8 - 2 = \boxed{10}$

3. $\lim_{x\to 1} \frac{x-1}{x^2-1} = \lim_{x\to 1} \frac{x-1}{(x-1)(x+1)} = \frac{1}{1+1} = \boxed{\frac{1}{2}}$

4. $\lim_{x\to 0} \frac{\sin x}{2x^2 - x} = \lim_{x\to 0} \frac{\sin x}{x(2x-1)} = \lim_{x\to 0} \frac{\sin x}{x} \cdot \lim_{x\to 0} \frac{1}{2x-1} = 1 \cdot \frac{1}{2(0)-1} = 1(-1) = \boxed{-1}$

   ↑ Memorized!

5. $\lim_{x\to \infty} \frac{\sin x}{2x^2 - x} = \lim_{x\to \infty} \frac{\sin x}{x(2x-1)} = \lim_{x\to \infty} \frac{\sin x}{x} \cdot \lim_{x\to \infty} \frac{1}{2x-1} = 0 \cdot 0 = \boxed{0}$

   ↑ Memorized!

6. $\lim_{x\to -7} 5 = \boxed{5}$

7. $\lim_{x\to \infty} \frac{3x-1}{|x-2|} \approx \lim_{x\to \infty} \frac{3x}{|x|} = \boxed{3}$ ← = 1 when plugging in positive x's

   EBM: $\frac{3x}{|x|}$

8. $\lim_{x\to -\infty} \frac{3x-1}{|x-2|} \approx \lim_{x\to -\infty} \frac{3x}{|x|} = \boxed{-3}$ ← = −1 when plugging in negative x's

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9. $\lim_{x\to\infty} e^{-x} = \lim_{x\to\infty} \frac{1}{e^x} = \boxed{0}$

10. $\lim_{x\to-\infty} e^{-x} = \lim_{x\to-\infty} \frac{1}{e^x} = \lim_{x\to\infty} e^x = \boxed{\infty}$

just "plugged in" – first to flip back up before values

11. $\lim_{x\to\pi^-} f(x)$ given $f(x) = \begin{cases} -2\cos x + 2 & x > \pi \text{ Right} \\ 5\sin x + 4 & x \le \pi \text{ Left} \end{cases}$

$= 5\sin\pi + 4 = 5(0) + 4 = \boxed{4}$

12. $\lim_{x\to\pi^+} f(x)$ given f(x) above

$= -2\cos\pi + 2 = -2(-1) + 2 = \boxed{4}$

13. $\lim_{x\to\pi} f(x)$ given f(x) above

$= \boxed{4}$ because LHL = RHL

14. Determine what (if any) are the horizontal asymptote(s) of $f(x) = \frac{3x^4-4}{5x^4}$

EBM: $\frac{3x^4}{5x^4} = \frac{3}{5}$ $\lim_{x\to\infty} \frac{3}{5} = \frac{3}{5}$

HA: $y = \frac{3}{5}$

15. Determine what (if any) are the horizontal asymptote(s) of $f(x) = \frac{3x^3-4}{5x^4}$

EBM: $\frac{3x^3}{5x^4} = \frac{3}{5x}$ $\lim_{x\to\infty} \frac{3}{5x} = 0$

HA: $y = 0$

16. Determine what (if any) are the horizontal asymptote(s) of $f(x) = \frac{3x^4-4}{5x^3}$

EBM: $\frac{3x^4}{5x^3} = \frac{3x}{5}$ $\lim_{x\to\infty} \frac{3x}{5} = \infty$

HA: None

17. Determine what (if any) are the horizontal asymptote(s) of $f(x) = \frac{2x+5}{|3x-4|}$

EBM: $\frac{2x}{|3x|}$ $\lim_{x\to\infty} \frac{2x}{|3x|} = \frac{2}{3}$ $= 1$ when plugging in positive x's

$\lim_{x\to-\infty} \frac{2x}{|3x|} = -\frac{2}{3}$ $= -1$ when plugging in negative x's

HA: $y = \frac{2}{3}$ and $y = \frac{-2}{3}$