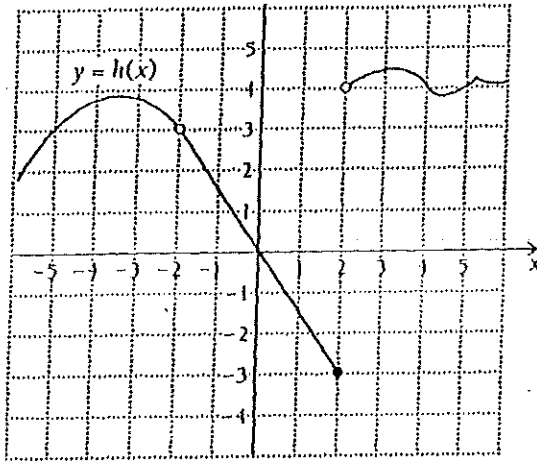Honors Brief Calculus

12.1-12.3 Review Worksheet

Name:_____

#1.

a) $\lim\limits_{x \to 2^+} h(x)$

d) $\lim\limits_{x \to 0^+} h(x)$

b) $\lim\limits_{x \to 2^-} h(x)$

e) $\lim\limits_{x \to 0^-} h(x)$

c) $\lim\limits_{x \to 2} h(x)$

f) $\lim\limits_{x \to 0} h(x)$

g) $\lim\limits_{x \to -2^+} h(x)$

h) $\lim\limits_{x \to -2^-} h(x)$

i) $\lim\limits_{x \to -2} h(x)$

In #2-7, find the limit algebraically:

#2.
$$\lim\limits_{x \to 2} \frac{x-1}{x+2}$$

#3.
$$\lim\limits_{x \to 3} \frac{x-3}{x^2-x-6}$$

#4.
$$\lim\limits_{x \to 9} \frac{\sqrt{x}-3}{x-9}$$

#5.
$$\lim\limits_{x \to 2} \frac{3x^2-4x+2}{7x^2-5x+3}$$

#6.
$$\lim\limits_{x \to 1} \frac{2-\sqrt{x+3}}{x-1}$$

#7.
$$\lim\limits_{x \to -2} \frac{x^3+8}{x^2-4}$$

#8. Consider:
$$g(x) = \begin{cases} -4 & \text{for } x=3 \\ 2x+5 & \text{for } x \neq 3 \end{cases}$$

Find each of the following:

$\lim\limits_{x \to 3^-} g(x)$
$\qquad$
$\lim\limits_{x \to 3^+} g(x)$
$\qquad$
$\lim\limits_{x \to 3} g(x)$
$\qquad$
$g(3) =$

Find the limit:

#9. $\lim\limits_{x\to\infty} \dfrac{2x^2 - 5x + 2}{5x^2 + 7x - 1}$

#10. $\lim\limits_{x\to\infty} \dfrac{x+1}{x}$

#11. $\lim\limits_{x\to\infty} \dfrac{x+1}{x^2 - 3x + 2}$

#12. $\lim\limits_{x\to 0^-} \dfrac{1}{x}$

#13. $\lim\limits_{x\to 5^-} \dfrac{x+1}{5-x}$

#14. $\lim\limits_{x\to 2^+} \dfrac{x^2 + x + 6}{x - 2}$

#15.

a) Find

$\lim\limits_{x\to 1^+} f(x) =$

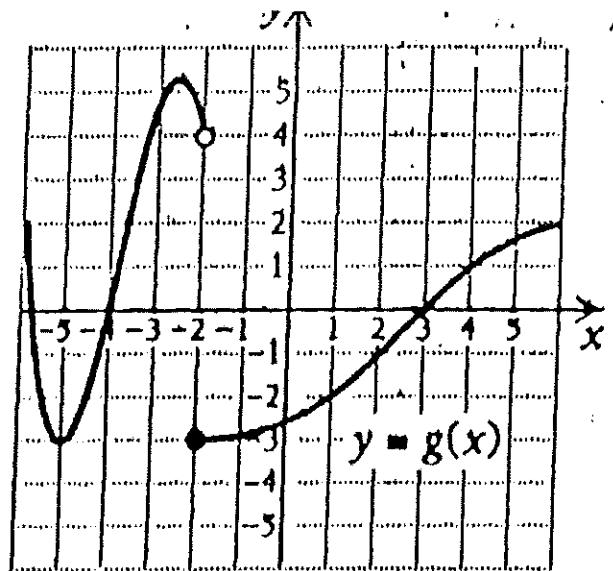$\lim\limits_{x\to 1^-} f(x) =$

$\lim\limits_{x\to 1} f(x) =$

b) Find $f(1)$

c) Is f continuous at $x = 1$?

d) Find $\lim\limits_{x\to -3} f(x) =$

e) Find $f(-2)$

f) Is f continuous at $x = -2$?

$y = g(x)$

#16. Find $\lim\limits_{x\to -1} f(x)$ and $f(-1)$ when $f(x) = \begin{cases} \dfrac{x^3 - x}{x+1} & \text{if } x \neq -1 \\ 1 & \text{if } x = -1 \end{cases}$