LIMITS

BLAKE FARMAN

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Name: _____

In each of the problems, evaluate the limit if it exists. Indicate any limit laws that you use. If the limit does not exist, explain why.

1. Use the limits

$$\lim_{x\to 2} f(x) = 4 \qquad \lim_{x\to 2} g(x) = -2 \qquad \lim_{x\to 2} h(x) = 0$$

to complete each of the following.

(a) $\lim_{x\to 2}[f(x) + 5g(x)]$

(c) $\lim_{x\to 2}\sqrt{f(x)}$

(e) $\lim_{x\to 2}\dfrac{g(x)}{h(x)}$

(b) $\lim_{x\to 2}[g(x)]^3$

(d) $\lim_{x\to 2}\dfrac{3f(x)}{g(x)}$

(f) $\lim_{x\to 2}\dfrac{g(x)h(x)}{f(x)}$

2. $\lim_{x \to -1} (x^4 - 3x)(x^2 + 5x + 3)$

3. $\lim_{u \to -2} \sqrt{u^4 + 3u + 6}$

4. $\lim_{t \to 2} \left(\frac{t^2 - 2}{t^3 - 3t + 5} \right)^2$

5. $\lim_{t\to -3} \dfrac{t^2-9}{2t^2+7t+3}$

6. $\lim_{x\to -3} \dfrac{x^2+3x}{x^2-x-12}$

7. $\lim_{x\to -2} \dfrac{x+2}{x^3+8}$

[Hint: $x^3+a^3=(x+a)(x^2-ax+a^2)$]

8. $\lim_{h\to 0} \dfrac{(2+h)^3 - 8}{h}$

9. $\lim_{t\to 0} \left(\dfrac{1}{t} - \dfrac{1}{t^2+t} \right)$

10. $\lim_{t\to 0} \left(\dfrac{\sqrt{1+t} - \sqrt{1-t}}{t} \right)$