

Find f . Find a . Find $f'(a)$ with Algebraic Manipulation. Interpret $f'(a)$

Limits of different quotients follow. Each of these is f' for some function f and some value a .

Report $f'(a)$, the function f , the value a , and interpret $f'(a)$. Use algebraic manipulation to find the limit.

TIPS: $A^2 - B^2 = (A+B)(A-B)$.

Break fractions into multiplicative factors: $\frac{A}{B \cdot C} = \frac{A \cdot 1}{B \cdot C} = \frac{A}{B} \cdot \frac{1}{C} = \frac{A}{BC}$ and $\frac{A \cdot \frac{1}{c}}{B} = \frac{A}{B} \cdot \frac{1}{c} = \frac{A}{B} \cdot \frac{1}{c} = \frac{A}{B \cdot c}$

Bring the number 1 in: $\frac{A}{B \cdot \frac{1}{c}} = \frac{A}{B \cdot \frac{1}{c}} \cdot 1 = \frac{A}{B \cdot \frac{1}{c}} \cdot \frac{c}{c}$

Take the number 1 out: $= \frac{A}{B \cdot \frac{1}{c}} \cdot \frac{c}{c} = \frac{A \cdot c}{B \cdot \frac{1}{c} \cdot c} = \frac{A \cdot c}{B \cdot \frac{c}{c}} = \frac{A \cdot c}{B \cdot 1} = \frac{A \cdot c}{B}$

1. $\lim_{x \rightarrow 5} \frac{4x-20}{x-5} = \boxed{}$ $f(x) = \underline{\hspace{2cm}}$ $a = \underline{\hspace{1cm}}$

2. $\lim_{x \rightarrow 3} \frac{x^2-9}{x-3} = \boxed{}$ $f(x) = \underline{\hspace{2cm}}$ $a = \underline{\hspace{1cm}}$

3. $\lim_{x \rightarrow 4} \frac{\sqrt{x}-2}{x-4} = \boxed{}$ $f(x) = \underline{\hspace{2cm}}$ $a = \underline{\hspace{1cm}}$

4. $\lim_{x \rightarrow 2} \frac{\frac{1}{x} - \frac{1}{2}}{x-2} = \boxed{}$ $f(x) = \underline{\hspace{2cm}}$ $a = \underline{\hspace{1cm}}$

5. $\lim_{x \rightarrow 1} \frac{\sqrt{3x+1} - 2}{x-1} = \boxed{}$ $f(x) = \underline{\hspace{2cm}}$ $a = \underline{\hspace{1cm}}$