More Guessing Limits

4. $\lim\limits_{n\to\infty} \left(\dfrac{2n+5}{9n+71}\right) = ?$

$$\dfrac{2 + \cancel{\frac{5}{n}}}{9 + \cancel{\frac{71}{n}}}$$

More: Spot The Difference!

7. $\lim\limits_{x\to1} \left(\dfrac{x-1}{x^2-1}\right) = \dfrac{1}{2}$

$$x^2 - 1 = (x-1)(x+1)$$

$$\dfrac{x-1}{x^2-1} = \dfrac{\cancel{x-1}}{\cancel{(x-1)}(x+1)} = \boxed{\dfrac{1}{x+1} \;\smile}$$

7. $\lim\limits_{x\to1} \left(\dfrac{x-1}{x^2-1}\right) = \dfrac{1}{2}$

$$1.01 - 1 = .01$$

$$1.0201 - 1 = .0201$$

9. $\lim\limits_{x\to0} \left(\dfrac{3x+x^2}{2x}\right) = ?$

$$\dfrac{3+x}{2}$$

Calculus is about change

The calculations involve limits.

$f(3) = 3^2 = 9$ $f(2) = 2^2 = 4$

10. What is the change in $f(x) = x^2$ between 2 and 3?

$f(2+h) - f(2)$

11. What is the change in $f(x) = x^2$ between 2 and $2 + h$?

$(2+h)^2 = 2^2 + 2 \cdot 2h + h^2$

A $= 2$ B $= h^2 - 2$ C $= 4h$ D $= h^2$ E $= 4h + h^2$

$4 + 4h + h^2 - 4 = 4h + h^2$