

$$\begin{aligned}
 f(x) &= x^3 \\
 \text{find } & \frac{f(a+h) - f(a)}{h} \\
 &= \frac{(a+h)^3 - a^3}{h} = \frac{a^3 + 3a^2h + 3ah^2 + h^3 - a^3}{h} \\
 &= \frac{3a^2h + 3ah^2 + h^3}{h} = 3a^2 + 3ah + h^2
 \end{aligned}$$

Sep 3-11:05 AM

$$\begin{aligned}
 f(x) &= \frac{1}{x} \\
 \text{find } & \frac{f(x+h) - f(x)}{h} \\
 &= \frac{\left(\frac{1}{x+h} - \frac{1}{x}\right) (x+h)x}{h(x+h)x} \\
 &= \frac{x - (x+h)}{h(x+h)x} = \frac{-\cancel{h}}{\cancel{h}(x+h)x} \\
 &= \frac{-1}{(x+h)x}
 \end{aligned}$$

Sep 3-11:14 AM