

$$d) (f-g)' = f' - g'$$

$$(f-g)'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - g(a+h) - (f(a) - g(a))}{h}$$

$$= \lim_{h \rightarrow 0} \frac{f(a+h) - g(a+h) - f(a) + g(a)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{f(a+h) - f(a) - g(a+h) + g(a)}{h}$$

$$= \lim_{h \rightarrow 0} \frac{f(a+h) - f(a) - (g(a+h) - g(a))}{h}$$

$$= \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h} - \left(\frac{g(a+h) - g(a)}{h} \right)$$

$$= \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h} - \lim_{h \rightarrow 0} \frac{g(a+h) - g(a)}{h}$$

$$= f'(a) - g'(a)$$