$g(x) = 2x^2 - 9$ $\quad [4, b]$ $\quad (4, 23)$ $\quad (b, 2b^2-9)$

$g(4) = 2(4)^2 - 9$

$= 2(16) - 9$

$32 - 9$

$= 23$

$g(b) = 2b^2 - 9$

$$\frac{2b^2-9-23}{b-4}$$

$$\frac{2b^2-32}{b-4}$$

$$\frac{2(b^2-16)}{b-4}$$

$$\frac{2(b-4)(b+4)}{b-4}$$

$2(b+4) = 2b+8$

$p(x) = 3x + 4 \quad [2, 2+h]$

$p(2) = 3(2) + 4$

$= 10$

$p(2+h) = 3(2+h) + 4$

$= 6 + 3h + 4$

$= 3h + 10$

$(2, \underset{y_1}{10}) \quad (\underset{x_2}{2+h}, \underset{y_2}{3h+10})$

$$\frac{3h + 10 - 10}{2 + h - 2} = \frac{3h}{h} = 3$$

$k(x) = 4x - 2$ $\quad [3, 3+h]$

$k(3) = 10$

$(3, 10)$

$k(3+h) = 4(3+h) - 2$

$12 + 4h - 2$

$4h + 10$

$$\frac{4h + 10 - 10}{3 + h - 3} = \frac{4h}{4} = 4$$

$f(x) = 2x^2 + 1$ $\quad [x, x+h] \rightarrow (x+h)(x+h)$

$(x, \underbrace{2x^2+1}_{y_1})$ $\quad f(x+h) = 2(x+h)^2 + 1$

$2(x^2+2xh+h^2)+1$

$2x^2+4xh+2h^2+1$ $\quad y_2$

$$\frac{2x^2+4xh+2h^2+1-(2x^2+1)}{x+h-x}$$

$$\frac{\cancel{2x^2}+4xh+2h^2+\cancel{1}-\cancel{2x^2}-\cancel{1}}{\cancel{x}+h-\cancel{x}}$$

$$\frac{2h^2+4xh}{h} = \frac{2h(h+2x)}{h}$$

$$= 2h+4x$$

$g(x) = 3x^2 - 2$ $\quad [x, x+h]$ $\quad (x+h)(x+h)$

$x^2 + xh + xh + h^2$

$(x, 3x^2 - 2)$ $\quad g(x+h) = 3(x+h)^2 - 2$

$3(x^2 + 2xh + h^2) - 2$

$3x^2 + 6xh + 3h^2 - 2$

$$\frac{3x^2 + 6xh + 3h^2 - 2 - (3x^2 - 2)}{x + h - x}$$

$$\frac{6xh + 3h^2}{h}$$

$$\frac{h(6x + 3h)}{h}$$

$6x + 3h$

$$a(t) = \frac{1}{t+4} \qquad [9, 9+h]$$

$$a(9) = \frac{1}{9+4} \qquad a(9+h) = \frac{1}{9+h+4}$$

$$= \frac{1}{13} \qquad = \frac{1}{h+13}$$

$$\left(9, \frac{1}{13}\right) \qquad \left(9+h, \frac{1}{h+13}\right)$$

$$\frac{13 \cdot \frac{1}{h+13} - \frac{1}{13(h+13)}}{9+h-9} \qquad \frac{\frac{13}{13(h+13)} - \frac{h+13}{13(h+13)}}{h}$$

$$\frac{\frac{-\cancel{h}}{13(h+13)} \cdot \frac{1}{\cancel{h}}}{h}$$

$$\frac{-1}{13(h+13)}$$

$b(x) = \frac{1}{x+3}$ $\quad [1, 1+h]$

$b(1) = \frac{1}{1+3} = \frac{1}{4}$ $\quad b(1+h) = \frac{1}{1+h+3}$

$= \frac{1}{h+4}$

$\left(1, \frac{1}{4}\right)$ $\quad \left(1+h, \frac{1}{h+4}\right)$

$$\frac{4 \cdot \frac{1}{h+4} - \frac{1}{4}(h+4)}{1+h-1} = \frac{\frac{4}{4(h+4)} - \frac{h+4}{4(h+4)}}{h}$$

$$\frac{\frac{-\cancel{h}}{4(h+4)}}{h} \cdot \frac{1}{\cancel{h}}$$

$$\frac{-1}{4(h+4)}$$