

$$f'(4) = \lim_{x \rightarrow 4} \frac{3x+2-14}{x-4}$$

$$f'(4) = \lim_{x \rightarrow 4} \frac{3x-12}{x-4}$$

$$= \lim_{x \rightarrow 4} \frac{3(\cancel{x-4})}{(\cancel{x-4})}$$

$$= \lim_{x \rightarrow 4} 3$$

f'(4) = 3

$$g'(3) = \lim_{x \rightarrow 3} \frac{2x^2-1-17}{x-3}$$

$$g'(3) = \lim_{x \rightarrow 3} \frac{2x^2-18}{x-3}$$

$$= \lim_{x \rightarrow 3} \frac{2(x^2-9)}{x-3}$$

$$= \lim_{x \rightarrow 3} \frac{2(x+3)(\cancel{x-3})}{\cancel{x-3}}$$

$$= \lim_{x \rightarrow 3} 2(x+3)$$

$$= 2(3+3)$$

g'(3) = 12

$$h'(2) = \lim_{x \rightarrow 2} \frac{x^3+1-9}{x-2}$$

$$= \lim_{x \rightarrow 2} \frac{x^3-8}{x-2}$$

$$= \lim_{x \rightarrow 2} \frac{(x-2)(x^2+2x+4)}{(\cancel{x-2})}$$

$$= \lim_{x \rightarrow 2} (x^2+2x+4)$$

$$= 4+4+4$$

h'(2) = 12

$$f'(3) = \lim_{x \rightarrow 3} \frac{\frac{1}{x} - \frac{1}{3}}{x-3}$$

$$= \lim_{x \rightarrow 3} \frac{\frac{1}{x} - \frac{1}{3}}{x-3} \cdot \frac{3x}{3x}$$

$$= \lim_{x \rightarrow 3} \frac{3-x}{3x(x-3)}$$

$$= \lim_{x \rightarrow 3} \frac{-1(\cancel{x-3})}{3x(\cancel{x-3})}$$

$$= \lim_{x \rightarrow 3} \frac{-1}{3x}$$

f'(3) = -1/9

$$g'(9) = \lim_{x \rightarrow 9} \frac{\sqrt{x}-\sqrt{9}}{x-9}$$

$$= \lim_{x \rightarrow 9} \frac{\sqrt{x}-3}{x-9}$$

$$= \lim_{x \rightarrow 9} \frac{\sqrt{x}-3}{(\sqrt{x}-3)(\sqrt{x}+3)}$$

FACTORS: "DIFF OF 2 SQUARES"

$$= \lim_{x \rightarrow 9} \frac{\cancel{\sqrt{x}-3}}{(\cancel{\sqrt{x}-3})(\sqrt{x}+3)}$$

$$= \lim_{x \rightarrow 9} \frac{1}{\sqrt{x}+3}$$

$$= \frac{1}{3+3}$$

$$= \frac{1}{6} \therefore g'(9) = \frac{1}{6}$$