(2-8) # 3, 4, 18 (KEY)

#3 p. 163 Look carefully to the graph related to the problem on page 163 $\Rightarrow$

slope at -2 > slope at 2 > slope at 4 > slope at 0

$\Rightarrow \quad g'(-2) > g'(2) > g'(4) > g'(0)$.

#4 p. 163 If the tangent line to $y = f(x)$ at $(4,3)$ passes through the point $(0,2)$ $\Rightarrow$

$f(4) = 3$ & $f'(4) = \frac{3-2}{4-0} = \frac{1}{4}$.

#18 / p. 163 $f(x) = \sqrt{3x+1}$ $\Rightarrow$

$$f'(a) = \lim_{h\to 0} \frac{1}{h}\left[f(a+h) - f(a)\right]$$

$$= \lim_{h\to 0} \frac{1}{h}\left[\sqrt{3a+3h+1} - \sqrt{3a+1}\right]$$

$$= \lim_{h\to 0} \frac{1}{h} \frac{\left(\sqrt{3a+3h+1} - \sqrt{3a+1}\right)\left(\sqrt{3a+3h+1} + \sqrt{3a+1}\right)}{\left(\sqrt{3a+3h+1} + \sqrt{3a+1}\right)}$$

$$= \lim_{h\to 0} \frac{1}{h} \frac{3a+3h+1-3a-1}{\left(\sqrt{3a+3h+1} + \sqrt{3a+1}\right)}$$

$$= \lim_{h\to 0} \frac{3}{\sqrt{3a+3h+1} + \sqrt{3a+1}} = \frac{3}{2\sqrt{3a+1}}.$$
