

$$\begin{aligned}
 (a) \quad f'(x) &= \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \\
 &= \lim_{h \rightarrow 0} \frac{\sqrt{3(x+h)-5} - \sqrt{3x-5}}{h} \\
 &= \lim_{h \rightarrow 0} \frac{\sqrt{3x+3h-5} - \sqrt{3x-5}}{h} \cdot \frac{(\sqrt{3x+3h-5} + \sqrt{3x-5})}{(\sqrt{3x+3h-5} + \sqrt{3x-5})} \\
 &= \lim_{h \rightarrow 0} \frac{3x+3h-5 - (3x-5)}{h(\sqrt{3x+3h-5} + \sqrt{3x-5})} \\
 &= \lim_{h \rightarrow 0} \frac{3h}{h(\sqrt{3x+3h-5} + \sqrt{3x-5})} \\
 &= \lim_{h \rightarrow 0} \frac{3}{\sqrt{3x+3h-5} + \sqrt{3x-5}} \\
 &= \frac{3}{\sqrt{3x-5} + \sqrt{3x-5}} \\
 &= \boxed{\frac{3}{2\sqrt{3x-5}}}
 \end{aligned}$$

$$\begin{aligned}
 (b) \quad m &= f'(2) \\
 &= \frac{3}{2\sqrt{3 \cdot 2 - 5}} \\
 &= \frac{3}{2}
 \end{aligned}$$

$$y - 1 = \frac{3}{2}(x - 2)$$

$$\boxed{y = \frac{3}{2}(x - 2) + 1}$$