3. $f(x) = \sqrt{x-2}$

1 $f(x) = \sqrt{x-2}$

2 $f(x+h) = \sqrt{(x+h)-2}$

$$= \sqrt{x+h-2}$$

3 $f''(x) = \lim_{h \to 0} \frac{f(x+h)-f(x)}{h}$

$$= \lim_{h \to 0} \frac{\sqrt{x+h-2} - \sqrt{x-2}}{h}$$

$$= \lim_{h \to 0} \frac{\sqrt{x+h-2} - \sqrt{x-2}}{h} \cdot \frac{\sqrt{x+h-2} + \sqrt{x-2}}{\sqrt{x+h-2} + \sqrt{x-2}}$$

$$= \lim_{h \to 0} \frac{x+h-2-(x-2)}{h(\sqrt{x+h-2} + \sqrt{x-2})}$$

$$= \lim_{h \to 0} \frac{x+h-2-x+2}{h(\sqrt{x+h-2} + \sqrt{x-2})}$$

$$= \lim_{h \to 0} \frac{\cancel{h}}{\cancel{h}(\sqrt{x+h-2} + \sqrt{x-2})}$$

$$= \lim_{h \to 0} \frac{1}{\sqrt{x+h-2} + \sqrt{x-2}}$$

$$= \frac{1}{\sqrt{x+0-2} + \sqrt{x-2}}$$

$$= \boxed{\frac{1}{2\sqrt{x-2}}}$$