Ex 2 (pg 38 ab notes)

$y = x\sqrt{x-2}$

domain: $x \geq 2$

$$y'(x) = \sqrt{x-2} + x\left(\frac{1}{2\sqrt{x-2}}\right) = \sqrt{x-2}\left(\frac{2\sqrt{x-2}}{2\sqrt{x-2}}\right) + \frac{x}{2\sqrt{x-2}}$$

$$= \frac{2(x-2)+x}{2\sqrt{x-2}} = \boxed{\frac{3x-4}{2\sqrt{x-2}}} = 0$$

when $x = 4/3$

at $x=2$, we have vertical slope

no min/max pts

$$y''(x) = \frac{2\sqrt{x-2}\,(3) - (3x-4)\left(\frac{1}{\sqrt{x-2}}\right)}{4(x-2)}$$

$$= \frac{\left(6\sqrt{x-2} - \frac{3x-4}{\sqrt{x-2}}\right)\sqrt{x-2}}{4(x-2)(\sqrt{x-2})} = \frac{6(x-2)-(3x-4)}{4(x-2)^{3/2}}$$

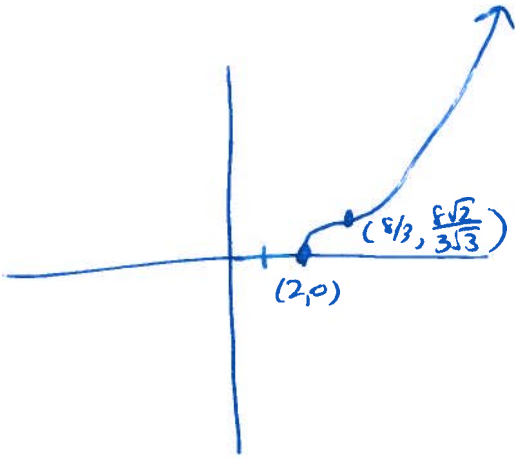
$$y'' = \boxed{\frac{3x-8}{4(x-2)^{3/2}}} = 0 \quad \text{only if} \quad x = 8/3$$

∩ ∪

inflection pt: $\left(8/3, \frac{8\sqrt{2}}{3\sqrt{3}}\right)$

$$y(8/3) = \frac{8}{3}\sqrt{\frac{8}{3}-2} = \frac{8\sqrt{2}}{3\sqrt{3}}$$

graph:



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