The graph of $y = \frac{2x}{\sqrt{x-1}}$, $x > 1$ has a local minimum.
Find the coordinates of this point.

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

$$y = \frac{u}{v}$$

$$\frac{dy}{dx} = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$$

$$u = 2x \qquad v = \sqrt{x-1} = (x-1)^{\frac{1}{2}}$$

$$\frac{du}{dx} = 2 \qquad \frac{dv}{dx} = \left(\frac{1}{2}\right) \cdot 1(x-1)^{-\frac{1}{2}}$$

$$\frac{dv}{dx} = \frac{1}{2\sqrt{x-1}}$$

$$\frac{dy}{dx} = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$$

$$\frac{dy}{dx} = \frac{\sqrt{x-1} \cdot 2 - 2x\frac{1}{2\sqrt{x-1}}}{\left(\sqrt{x-1}\right)^2}$$

$$\frac{dy}{dx} = \frac{2\sqrt{x-1} - \frac{x}{\sqrt{x-1}}}{x-1}$$

$$\frac{dy}{dx} = \frac{\frac{2(x-1)}{\sqrt{x-1}} - \frac{x}{\sqrt{x-1}}}{x-1}$$

$$\frac{dy}{dx} = \frac{\frac{2(x-1)-x}{\sqrt{x-1}}}{x-1}$$

$$\frac{dy}{dx} = \frac{2x-2-x}{(x-1)\sqrt{x-1}}$$

$$\frac{dy}{dx} = \frac{x-2}{(x-1)^{\frac{3}{2}}}$$

Local maximum occurs where $\frac{dy}{dx} = 0$

$$\frac{x-2}{(x-1)^{\frac{3}{2}}} = 0$$

$x \neq 1$, since $x > 1$

$$x - 2 = 0$$

$$x = 2$$

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

$$y = \frac{2(2)}{\sqrt{2-1}} = 4$$

Minimum at (2,4)