

**Exercise 3**Calculate  $y'$ .

$$y = \frac{x^2 - x + 2}{\sqrt{x}}$$

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**Solution**Calculate  $y'$  by using the power rule.

$$\begin{aligned}y' &= \frac{d}{dx} \left( \frac{x^2 - x + 2}{\sqrt{x}} \right) \\&= \frac{d}{dx} \left( \frac{x^2}{\sqrt{x}} - \frac{x}{\sqrt{x}} + \frac{2}{\sqrt{x}} \right) \\&= \frac{d}{dx} \left( \frac{x^2}{x^{1/2}} - \frac{x}{x^{1/2}} + \frac{2}{x^{1/2}} \right) \\&= \frac{d}{dx} (x^{3/2} - x^{1/2} + 2x^{-1/2}) \\&= \frac{d}{dx} (x^{3/2}) - \frac{d}{dx} (x^{1/2}) + 2 \frac{d}{dx} (x^{-1/2}) \\&= \left( \frac{3}{2} \right) x^{3/2-1} - \left( \frac{1}{2} \right) x^{1/2-1} + 2 \left( -\frac{1}{2} \right) x^{-1/2-1} \\&= \frac{3}{2} x^{1/2} - \frac{1}{2} x^{-1/2} - x^{-3/2} \\&= \frac{3}{2} x^{1/2} - \frac{1}{2x^{1/2}} - \frac{1}{x^{3/2}} \\&= \frac{3}{2} \sqrt{x} - \frac{1}{2\sqrt{x}} - \frac{1}{\sqrt{x^3}}\end{aligned}$$