

Exercise 24

Differentiate the function.

$$G(t) = \sqrt{5t} + \frac{\sqrt{7}}{t}$$

Solution

Rewrite the given function.

$$G(t) = \sqrt{5}t^{1/2} + \sqrt{7}t^{-1}$$

Take the derivative of this function.

$$G'(t) = \frac{d}{dt}(\sqrt{5}t^{1/2} + \sqrt{7}t^{-1})$$

Use the sum rule.

$$G'(t) = \frac{d}{dt}(\sqrt{5}t^{1/2}) + \frac{d}{dt}(\sqrt{7}t^{-1})$$

Use the constant multiple rule.

$$G'(t) = \sqrt{5} \frac{d}{dt}(t^{1/2}) + \sqrt{7} \frac{d}{dt}(t^{-1})$$

Use the power rule.

$$G'(t) = \sqrt{5} \left(\frac{1}{2} t^{-1/2} \right) + \sqrt{7} (-t^{-2})$$

Therefore,

$$G'(t) = \frac{\sqrt{5}}{2} t^{-1/2} - \sqrt{7} t^{-2}.$$