

21te Mathe HÜ am 06.12.22

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4.165b)

$$f(x) = x \cdot \sqrt[3]{x+2} = f(x) = \sqrt[3]{x^4 + 2x^3} = (x^4 + 2x^3)^{\frac{1}{3}}$$

$$f'(x) = \frac{1 \cdot 4x^3 + 6x^2}{3 \cdot \sqrt[3]{(x^4 + 2x^3)^2}}$$

$$c) y = \ln\left(\sqrt[5]{x^7} \cdot \sqrt[7]{x^5}\right) = f(x) = \ln\left(x^{\frac{7}{5}} \cdot x^{\frac{5}{7}}\right) = \ln\left(x^{\frac{74}{35}}\right)$$

$$f(x) = \frac{74}{35} \cdot \ln(x) \quad f'(x) = \frac{74}{35} \cdot \frac{1}{x}$$

$$4.168a) f(x) = \sqrt{\frac{x+2}{2-x}} = \left(\frac{x+2}{2-x}\right)^{\frac{1}{2}}$$

$$f'(x) = \frac{1}{2} \cdot \left(\frac{2-x}{x+2}\right)^{-\frac{1}{2}} \cdot \frac{1}{(2-x)^2}$$

$$f'(x) = \frac{\sqrt{\frac{2-x}{x+2}}}{(2-x)^2}$$

$$u = x+2 \quad u' = 1$$

$$v = 2-x \quad v' = -1$$

$$p' = \frac{\cancel{x+2} (2-x) + (x+2)}{(2-x)^2}$$

$$p' = \frac{4}{(2-x)^2}$$