

S 124 Nr. 1

$$a) f(x) = 12 \cdot \sin(x) \Rightarrow f'(x) = 12 \cdot \cos(x)$$

$$b) f(x) = -2 \cdot \cos(x) \Rightarrow f'(x) = -2 \cdot (-\sin(x)) = 2 \cdot \sin(x)$$

$$c) f(x) = \sqrt{5} \cdot \cos(x) \Rightarrow f'(x) = -\sqrt{5} \cdot \sin(x)$$

$$d) f(x) = \frac{1}{\pi} \cdot \sin(x) \Rightarrow f'(x) = \frac{1}{\pi} \cdot \cos(x)$$

$$e) f(x) = 5x^3 - \sin(x) \Rightarrow f'(x) = 15x^2 - \cos(x)$$

$$f) f(x) = 2 \cos(x) - \sin(x) \Rightarrow f'(x) = 2 \cdot (-\sin(x)) - \cos(x)$$

$$f'(x) = -2 \sin(x) - \cos(x)$$

S 124 Nr 2

$$a) f(x) = -9 \cdot \sin(x) \Rightarrow f'(x) = -9 \cdot \cos(x) \Rightarrow \underline{\underline{f'(\pi) = -9 \cdot \cos(\pi) = -9 \cdot (-1) = 9}}$$

$$b) f(x) = 5 + \cos(x) \Rightarrow f'(x) = -\sin(x) \Rightarrow \underline{\underline{f'(\pi) = -\sin(\pi) = 0}}$$

$$c) f(x) = 5x - \cos(x) \Rightarrow f'(x) = 5 + \sin(x) \Rightarrow \underline{\underline{f'(\pi) = 5 + \sin(\pi) = 5 + 0 = 5}}$$

$$d) f(x) = x^2 - \frac{1}{2} \cos(x) \Rightarrow f'(x) = 2x + \frac{1}{2} \sin(x)$$

$$\underline{\underline{f'(\pi) = 2 \cdot \pi + \frac{1}{2} \sin(\pi) = 2 \cdot \pi + 0 = 2\pi}}$$

$$e) f(x) = \frac{1}{x} + \frac{\sin(x)}{2} \Rightarrow f'(x) = -\frac{1}{x^2} + \frac{1}{2} \cos(x)$$

$$\underline{\underline{f'(\pi) = -\frac{1}{\pi^2} + \frac{1}{2} \cdot \cos(\pi) = -\frac{1}{\pi^2} + \frac{1}{2} \cdot (-1) = -\frac{1}{\pi^2} - \frac{1}{2}}}$$

$$f) f(x) = \frac{2}{x^2} + 2 \sin x \Rightarrow f'(x) = \frac{-4}{x^3} + 2 \cdot \cos(x)$$

$$\underline{\underline{f'(\pi) = \frac{-4}{\pi^3} + 2 \cos(\pi) = \frac{-4}{\pi^3} + 2 \cdot (-1) = \frac{-4}{\pi^3} - 2}}$$