

1.1. LÍNULEG NÁLGUN

SKILGR. 1.1
BLS. 9

EF $f(x)$ ER DIFFRANLEGT FALL
Í PUNKTINUM $x = x_0$ ER FALLIÐ

$$L(x) = f(x_0) + f'(x_0) \cdot (x - x_0)$$

NEFNT LÍNULEG NÁLGUN $f(x)$

DÆMI 1.1
BLS. 10

FINNIÐ LÍNULEGA NÁLGUN
FALLSINS $f(x) = \sqrt{x+4}$ Í $x_0 = 0$.

1. REIKNNA $f(x_0)$

$$f(x_0) = f(0) = \sqrt{0+4} = \sqrt{4} = 2$$

2. FINNA AFLEIÐUNA $f'(x)$

$$f'(x) = \frac{1}{2\sqrt{x+4}} \cdot (1+0) = \frac{1}{2\sqrt{x+4}}$$

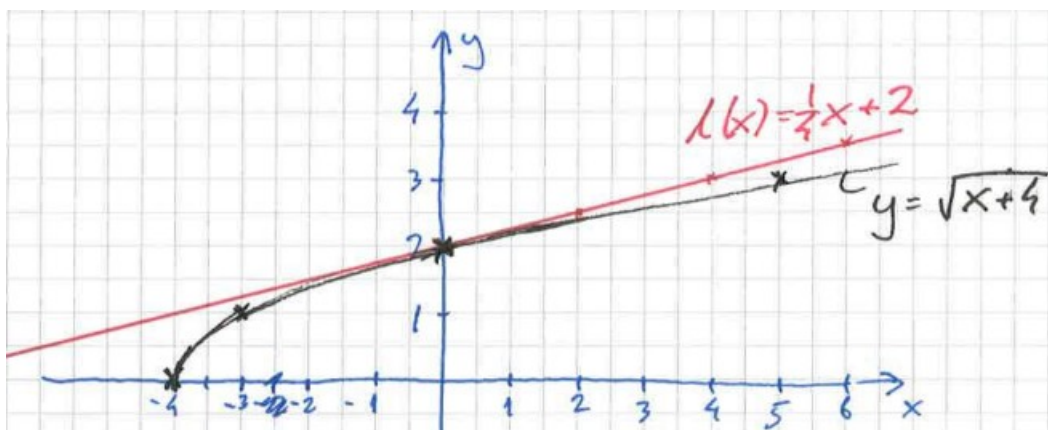
3. REIKNNA GILDI AFLEIÐU $f'(x_0)$

$$f'(x_0) = \frac{1}{2 \cdot \sqrt{0+4}} = \frac{1}{2 \cdot \sqrt{4}} = \frac{1}{2 \cdot 2} = \frac{1}{4}$$

4. LÍNULEG NÁLGUN

$$L(x) = f(x_0) + f'(x_0) \cdot (x - x_0)$$

$$L(x) = 2 + \frac{1}{4} \cdot (x - 0) = \frac{1}{4}x + 2$$



DAEMI 1.2 BLS. 10

FINNIÐ LÍNULEGA NÁLGUN $f(x) = \sin(2x)$; $x_0 = \frac{\pi}{12}$

1. REIKNNA FALLGILDIÐ $f(x_0)$

$$f(x_0) = f\left(\frac{\pi}{12}\right) = \sin\left(2 \cdot \frac{\pi}{12}\right) = \sin\left(\frac{\pi}{6}\right) = \frac{1}{2}$$

2. FINNA AFLÆÐU $f(x)$

$$f(x) = \sin(2x)$$

$$f'(x) = \cos(2x) \cdot 2 = 2\cos(2x)$$

3. REIKNNA GILDI AFLÆÐUNNAR $f'(x_0)$

$$f'(x_0) = f'\left(\frac{\pi}{12}\right) = 2 \cdot \cos\left(2 \cdot \frac{\pi}{12}\right) = 2 \cdot \cos\left(\frac{\pi}{6}\right) = 2 \cdot \frac{\sqrt{3}}{2} = \sqrt{3}$$

4. LÍNULEG NÁLGUN

$$L(x) = f(x_0) + f'(x_0) \cdot (x - x_0)$$

$$L(x) = \frac{1}{2} + \sqrt{3} \cdot \left(x - \frac{\pi}{12}\right) = \sqrt{3} \cdot x + \frac{6 - \sqrt{3} \cdot \pi}{12}$$