Ül. 25

$y = x^3 - 3x^2$

a) $y' = 3x^2 - 6x$

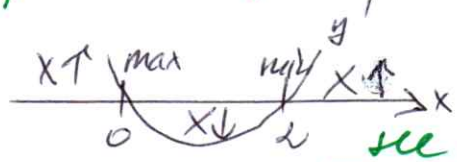
b) $x \uparrow \; y' > 0$ kirjuta tingimused!

$x \downarrow \; y' < 0$

$3x^2 - 6x > 0$

$3x(x-2) > 0$

$x_1 = 0 \quad x_2 = 2$



see joonis väärtustab sind selgitusele kirjutamisest

$x_1 \uparrow =]-\infty; 0[\quad x_2 \uparrow =]2; \infty[, \quad x \downarrow =]0; 2[$

c) joonisel $x_{max} = 0$, $x_{min} = 2$

$y(0) = 0$, $y(2) = 2^3 - 3 \cdot 2^2 = 8 - 3 \cdot 4 = -4$

$P_{max}(2; -4)$, $P_{min}(0; 0)$

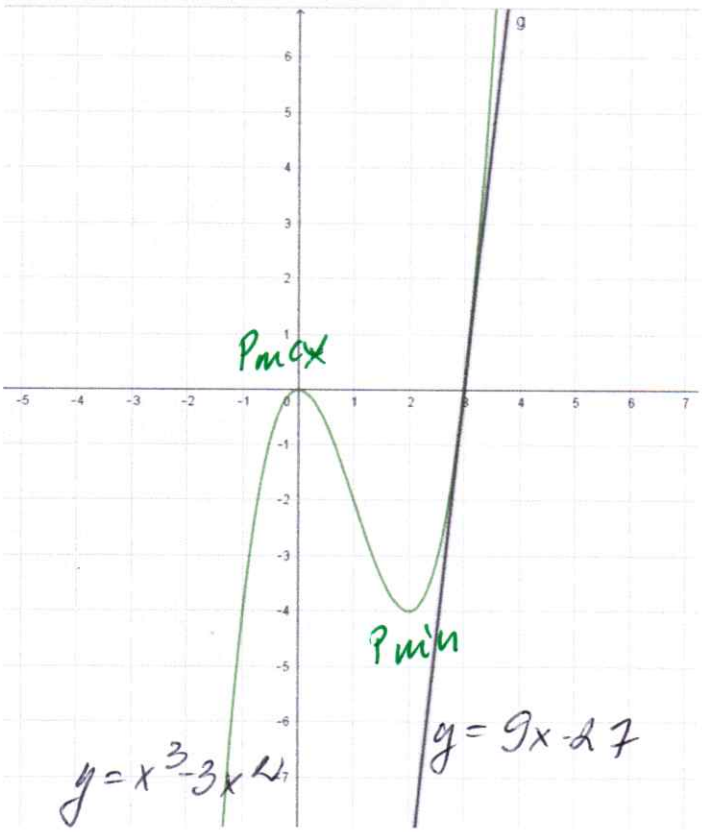
d) $k = f'(x_0) \quad x_0 = 3 \quad k = 3 \cdot 3^2 - 6 \cdot 3 = 9$

e) Puutuja võrrand $x_0 = 3$

$y_0 = 3^3 - 3 \cdot 3^2 = 0 \quad P(3; 0)$

$y - 0 = 9(x - 3)$

$y = 9x - 27$



Graafiku joonestamisel kasuta arvutatud tulemusi ja leia mõned lisapunktid.

Nullkohad

$x^3 - 3x^2 = 0$

$x^2(x-3) = 0$

$x_{1,2} = 0$

$x = 3$