Užduotis.

Apskaičiuokite apskritimo, duoto parametrinėmis lygtimis $\begin{cases} x = 3\cos(t) \\ y = 3\sin(t) \end{cases}$, liestinę, kai $t = \frac{\pi}{4}$.
Nubraižykite grafiką.

Sprendimas.

Liestinės lygtis:

$y - y_0 = y'(x_0)(x - x_0)$, kai $y = f(x)$.

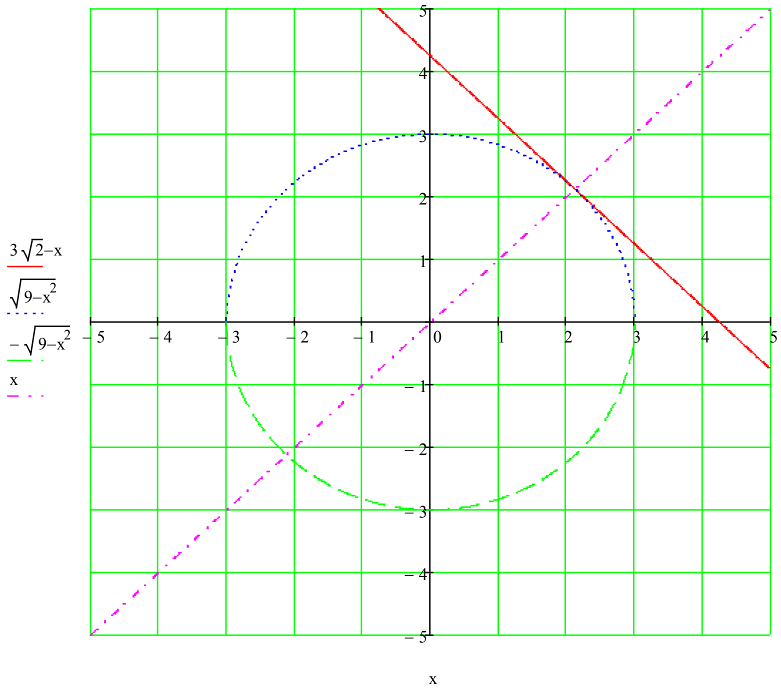
$y - y_0 = y_x'(t_0)(x - x_0)$, kai $\begin{cases} x = f(t) \\ y = g(t) \end{cases}$.

Randame tašką $M_0(x_0; y_0)$:

$x_0 = 3\cos\left(\frac{\pi}{4}\right) = \frac{3\sqrt{2}}{2}$

$y = 3\sin\left(\frac{\pi}{4}\right) = \frac{3\sqrt{2}}{2}$

Taigi gavom $M_0\left(\frac{3\sqrt{2}}{2}; \frac{3\sqrt{2}}{2}\right)$.



Ieškom $y_x' = \frac{y_t'}{x_t'} = \frac{3\cos(t)}{-3\sin(t)} = -ctg(t)$

$y_x'\left(\frac{\pi}{4}\right) == -ctg\left(\frac{\pi}{4}\right) = -1.$

Taigi liestinė lygi:

$y - y_0 = y_x'(t_0)(x - x_0)$

$y - \frac{3\sqrt{2}}{2} = -\left(x - \frac{3\sqrt{2}}{2}\right)$

$y = -x + 2 \cdot \frac{3\sqrt{2}}{2} = 3\sqrt{2} - x.$