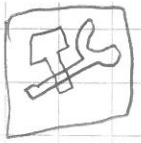
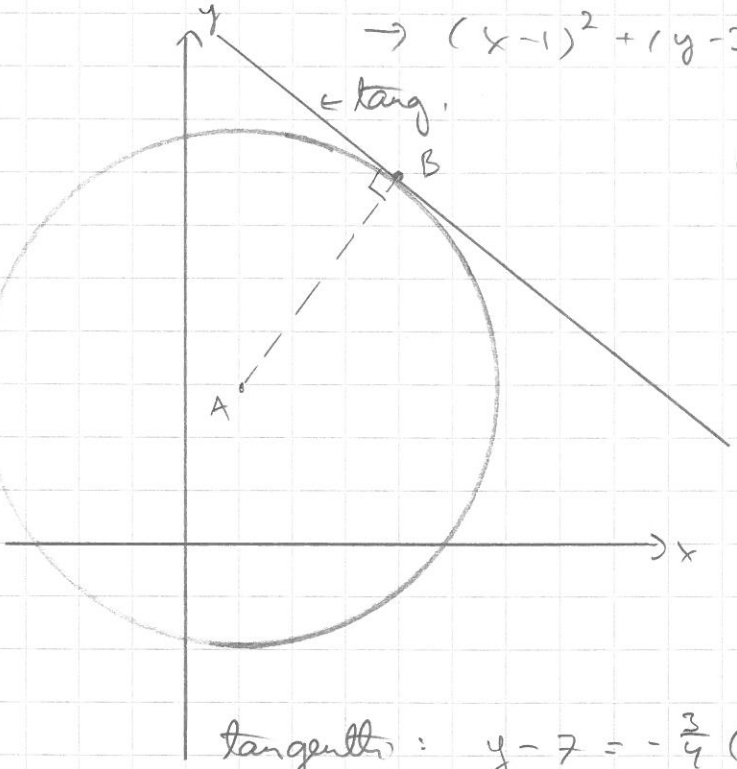
TI-nspire:  → 3: Algebra → 5: Taylenno neliöksi

→ completeSquare($x^2+y^2-2x-6y-15=0, x, y$)

→ $(x-1)^2+(y-3)^2=25$



$(4,7)$: $4^2+7^2-2\cdot4-6\cdot7-15=0$

$\Leftrightarrow 0=0$ ✓

$\Rightarrow (4,7)$ on ympyrällä

$\Rightarrow$ 1 tangentti

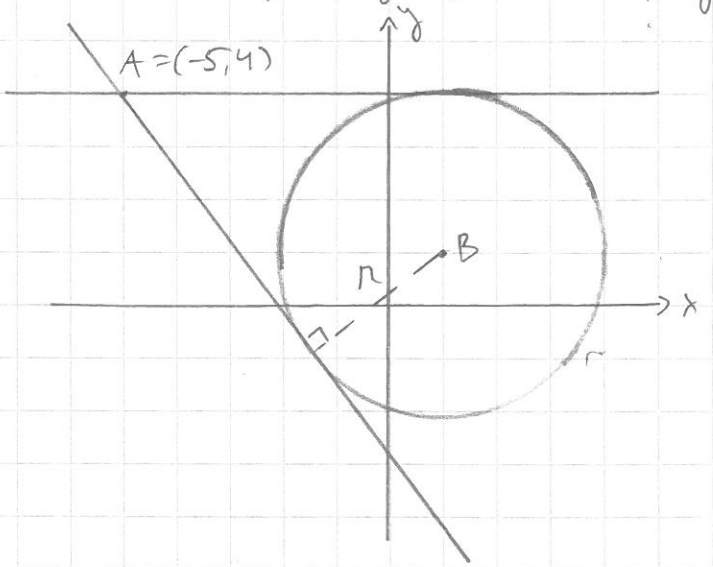
$$k_{AB}=\frac{\Delta y}{\Delta x}=\frac{7-3}{4-1}=\frac{4}{3}$$

$k_t \cdot k_{AB}=-1 \Leftrightarrow k_t=-\frac{1}{k_{AB}}=-\frac{1}{\frac{4}{3}}=-\frac{3}{4}$

tangentti: $y-7=-\frac{3}{4}(x-4)$

$\Leftrightarrow y-7=-\frac{3}{4}x+3 \Leftrightarrow \underline{y=-\frac{3}{4}x+10}$

13.4 $(x-1)^2+(y-1)^2=9$, $k_p=(1,1)$, $r=\sqrt{9}=3$



$|AB|=\sqrt{(1-(-5))^2+(1-4)^2}$

$=\sqrt{36+9}=\sqrt{45}>3$

$\Rightarrow$ A on ympyrän ulkopuolella

$\Rightarrow$ 2 tangenttia

tangentti:

$y-4=k(x-(-5))$

$\Leftrightarrow y-4=kx+5k$

$\Leftrightarrow kx-y+5k+4=0$

k_p:n (pisteB) etäisyys tangentista = säde

$$\frac{|k\cdot1-1+5k+4|}{\sqrt{k^2+(-1)^2}}=3 \Leftrightarrow \frac{|6k+3|}{\sqrt{k^2+1}}=3 \quad |\cdot\sqrt{k^2+1}$$

$\Leftrightarrow |6k+3|=3\sqrt{k^2+1} \quad |()^2$

$\Leftrightarrow (6k+3)^2=(3\sqrt{k^2+1})^2$

$\Leftrightarrow 36k^2+36k+9=9(k^2+1)$

$\Leftrightarrow 27k^2+36k=0 \Leftrightarrow 9k(3k+4)=0 \Leftrightarrow k=0$ tai $k=-\frac{4}{3}$

$k=0$: $0\cdot x-y+5\cdot0+4=0 \Leftrightarrow \underline{y=4}$