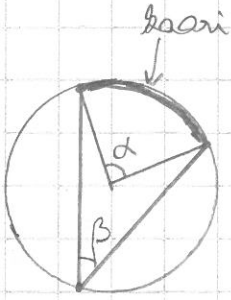
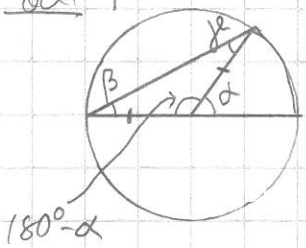
11. Ympyrän kehäkulma ja keskuskulma



Kehäkulma (β) on puolet samaa kaarta vastaavasta keskuskulmasta (α)

$$\boxed{\beta = \frac{\alpha}{2} \Leftrightarrow \alpha = 2\beta}$$ KEHÄKULMALAUSE

Tod. 1°

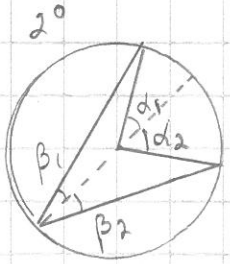


$\gamma = \beta$ (tasakylkisen kolmion kantakulmat)

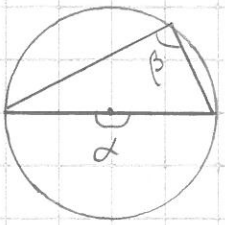
$\Rightarrow \beta + \beta + (180° - \alpha) = 180°$

$\Leftrightarrow 2\beta = \alpha$

2°



$$\alpha = \alpha_1 + \alpha_2 \overset{1°}{=} 2\beta_1 + 2\beta_2 = 2(\beta_1 + \beta_2) = 2\beta$$

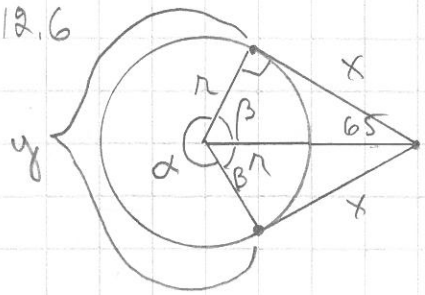


$$\beta = \frac{\alpha}{2} = \frac{180°}{2} = 90°$$

Siis: puoliympyrän kehäkulma on suora kulma

12. Ympyrän tangentti

12.6



$$r = \frac{220\,m}{2} = 110\,m$$

Pythagoras: $x^2 + r^2 = (r + 65)^2$

$\Leftrightarrow x^2 = 175^2 - 110^2 \quad |\sqrt{}$

$\Leftrightarrow x \approx (\pm)\ 136,107\ (m)$

$$\cos\beta = \frac{r}{r+65} = \frac{110}{110+65} \Rightarrow \beta \approx 51,0552°$$

$$y = \frac{360° - 2\beta}{360°} \cdot 2\pi r = \ldots \approx 495,113\,m$$

reitin kylkiin pituus $= 2x + y \approx 767,326\,m = \underline{770\,m}$

12.8