Rechthoek in ovaal

16. $AB = 2\cos\alpha + 2$

$AD = 2\sin\alpha$

$$O = AB \cdot AD = (2\cos\alpha + 2) \cdot 2\sin\alpha = 2 \cdot 2\sin\alpha\cos\alpha + 4\sin\alpha$$
$$= 2\sin 2\alpha + 4\sin\alpha$$

17. $O = 2\sin 2\alpha + 4\sin\alpha$

$$\frac{dO}{d\alpha} = 2 \cdot 2\cos 2\alpha + 4\cos 2\alpha = 4\cos 2\alpha + 4\cos\alpha = 4 \cdot (\cos 2\alpha + \cos\alpha) =$$
$$= 4 \cdot (2\cos(\tfrac{1}{2}(2\alpha + \alpha)) \cdot \cos(\tfrac{1}{2}(2\alpha - \alpha)) =$$
$$= 4 \cdot (2\cos 1\tfrac{1}{2}\alpha \cdot \cos\tfrac{1}{2}\alpha) =$$
$$= 8 \cdot \cos 1\tfrac{1}{2}\alpha \cdot \cos\tfrac{1}{2}\alpha$$

18. Maximale oppervlakte $\rightarrow$ $\frac{dO}{d\alpha} = 0$

$8 \cdot \cos 1\tfrac{1}{2}\alpha \cdot \cos\tfrac{1}{2}\alpha = 0$

$\cos 1\tfrac{1}{2}\alpha = 0 \quad \vee \quad \cos\tfrac{1}{2}\alpha = 0$

$1\tfrac{1}{2}\alpha = \tfrac{1}{2}\pi + k \cdot \pi \quad \vee \quad \tfrac{1}{2}\alpha = \tfrac{1}{2}\pi + k \cdot \pi$

$\alpha = \tfrac{1}{3}\pi + k \cdot \tfrac{2}{3}\pi \quad \vee \quad \alpha = \pi + k \cdot 2\pi$

op $0 < \alpha < \tfrac{1}{2}\pi$ $\quad \alpha = \tfrac{1}{3}\pi$

$O = 2\sin 2 \cdot \tfrac{1}{3}\pi + 4\sin\tfrac{1}{3}\pi = 2 \cdot \tfrac{1}{2}\sqrt{3} + 4 \cdot \tfrac{1}{2}\sqrt{3} = 3\sqrt{3}$