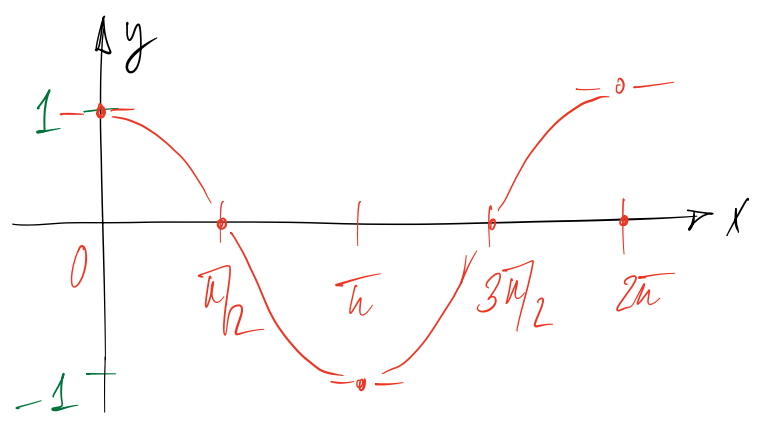
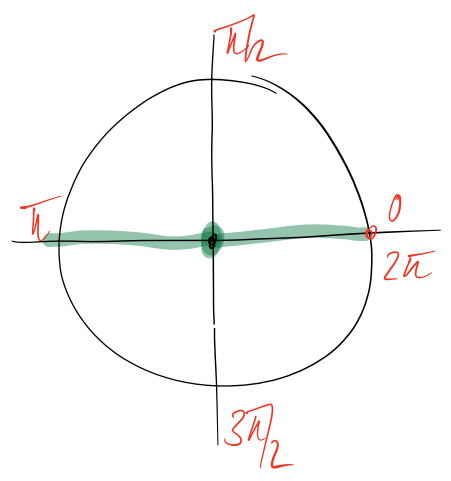
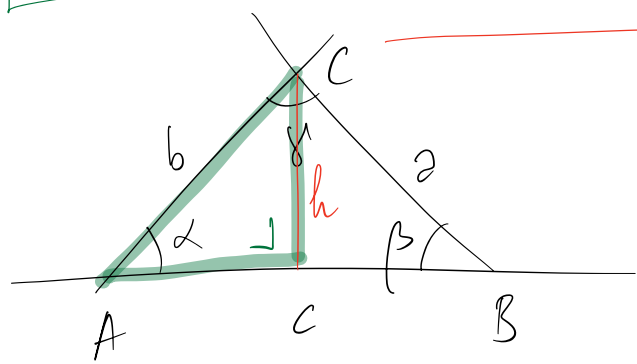


Graph of the function cosinus



$$\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma} = 2r$$

$$A = \frac{1}{2} ab \sin \gamma = \frac{1}{2} bc \sin \alpha = \frac{1}{2} ac \sin \beta$$



$$A = \frac{1}{2} \cdot c \cdot h$$

$$\sin \alpha = \frac{h}{b} \Leftrightarrow h = b \sin \alpha$$

$$\Rightarrow A = \frac{1}{2} bc \sin \alpha$$

$$A = \frac{1}{2} bc \sin \alpha \quad \text{et} \quad \frac{a}{\sin \alpha} = 2r \Leftrightarrow \frac{a}{2r} = \sin \alpha$$

$$\Rightarrow A = \frac{1}{2} bc \cdot \frac{a}{2r} = \frac{abc}{4r} \quad \checkmark$$

2) du 4.4.11

4.4.11

$$b) A = \frac{abc}{4r} \quad (2)$$

$$= \frac{8r^3}{4r} \cdot \frac{\sin \alpha \sin \beta \sin \gamma}{1} = \frac{8r^3 \sin \alpha \sin \beta \sin \gamma}{4r}$$

$$= 2r^2 \sin \alpha \sin \beta \sin \gamma$$

$$\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma} = 2r$$

$$a = 2r \sin \alpha$$

$$b = 2r \sin \beta$$

$$c = 2r \sin \gamma$$

$$abc = 8r^3 \sin \alpha \sin \beta \sin \gamma$$

$$\frac{3 \cdot 4 \cdot 5}{4} = \frac{3}{4} \cdot 4 \cdot 5$$

$$= 3 \cdot \frac{4}{4} \cdot 5$$

$$= 3 \cdot 4 \cdot \frac{5}{4}$$

4.4.11 b)

$$A = \frac{1}{2} bc \sin \alpha \quad \text{et} \quad \left[\frac{b}{\sin \beta} = \frac{c}{\sin \gamma} = 2r \right]$$

$$\Leftrightarrow \left[\begin{array}{l} b = 2r \sin \beta \\ c = 2r \sin \gamma \end{array} \right]$$

$$\Rightarrow A = \frac{1}{2} \cdot 2r \sin \beta \cdot 2r \sin \gamma \cdot \sin \alpha$$

$$= 2r^2 \sin \alpha \sin \beta \sin \gamma$$