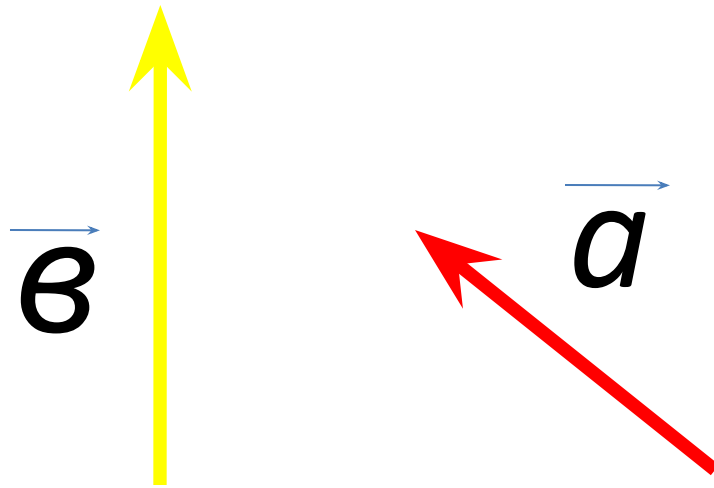
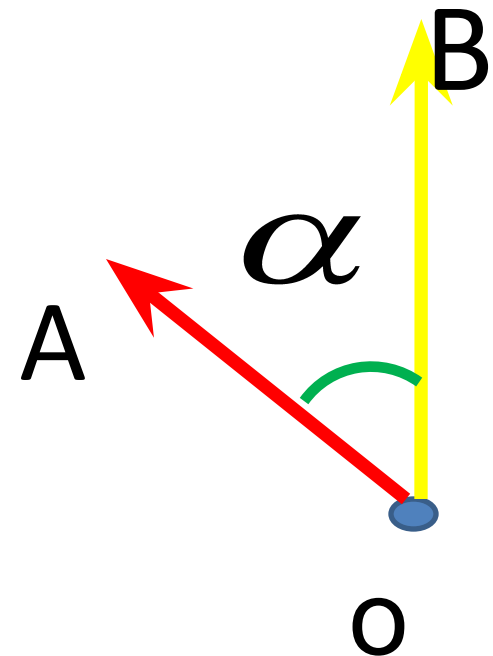
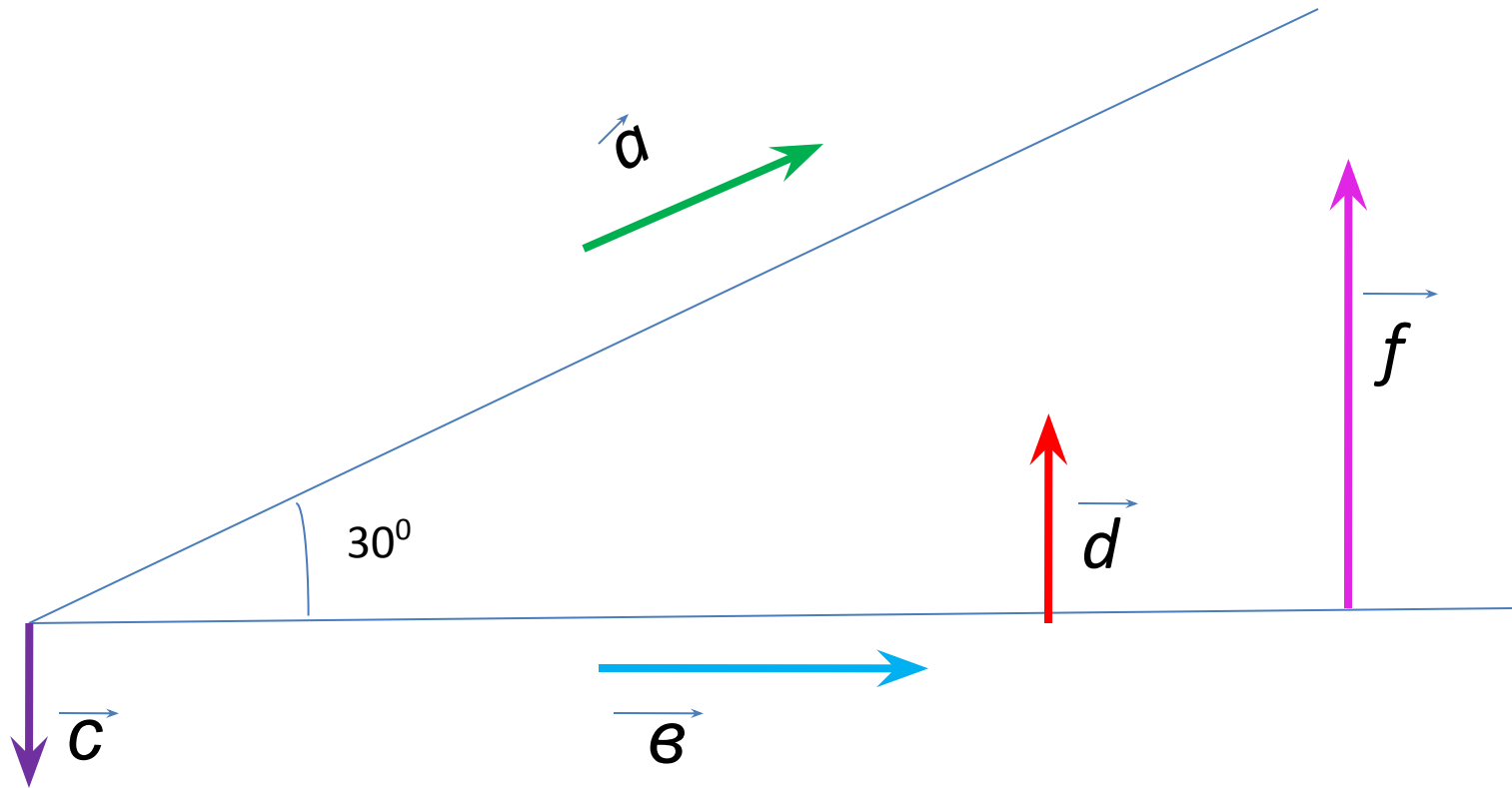


1. Угол между векторами.

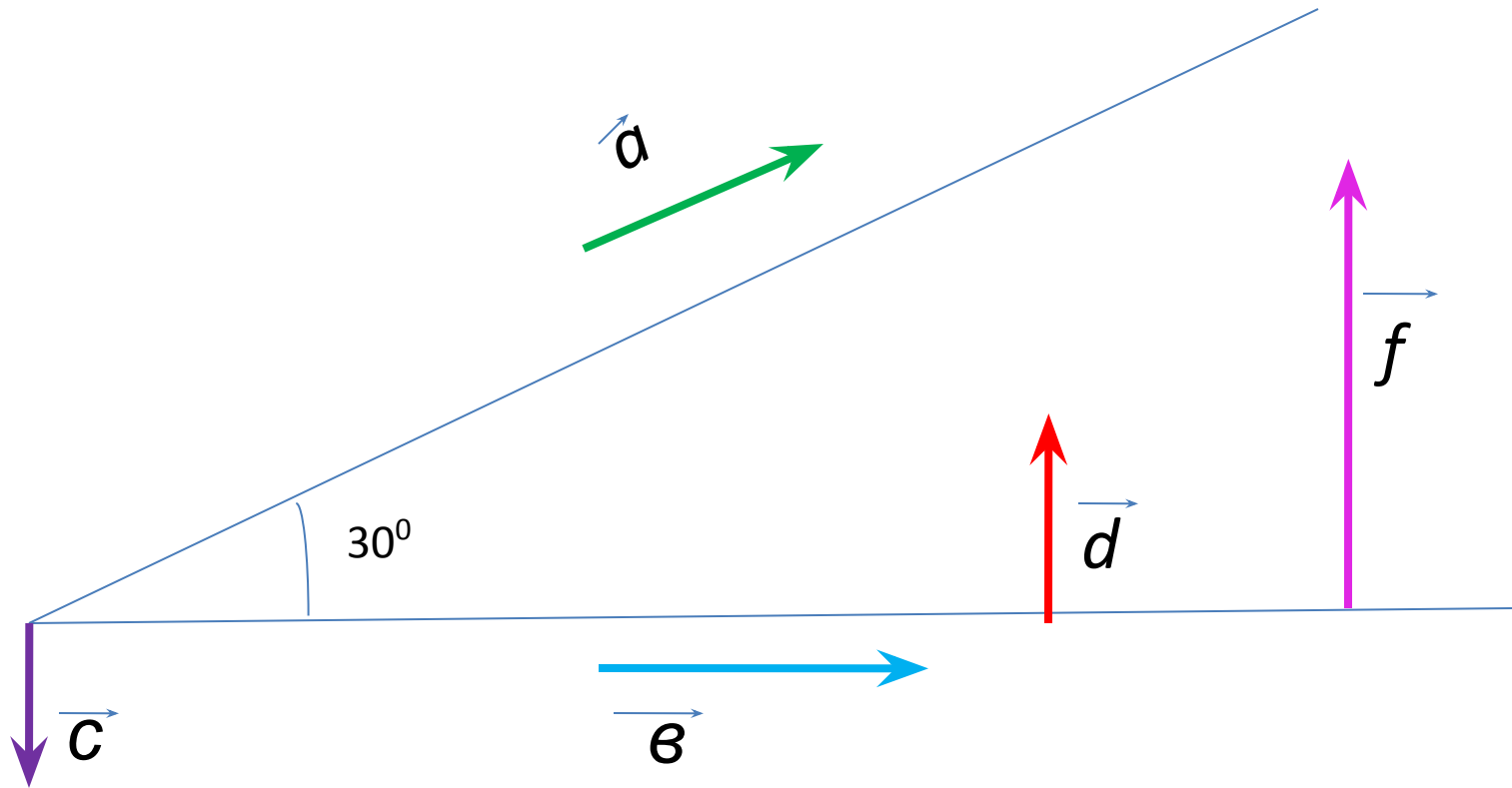


$$\alpha = \widehat{a} \wedge b$$

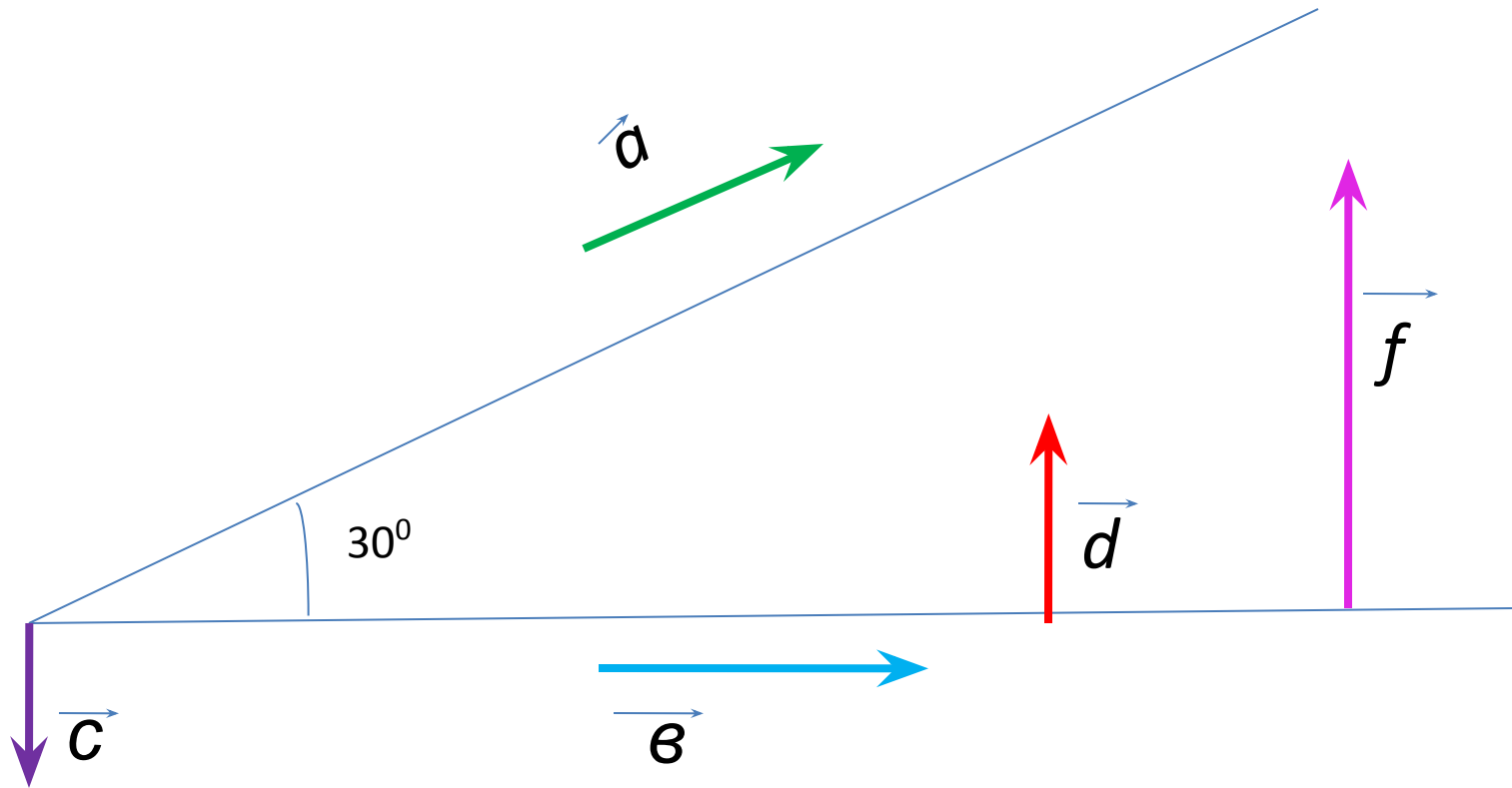




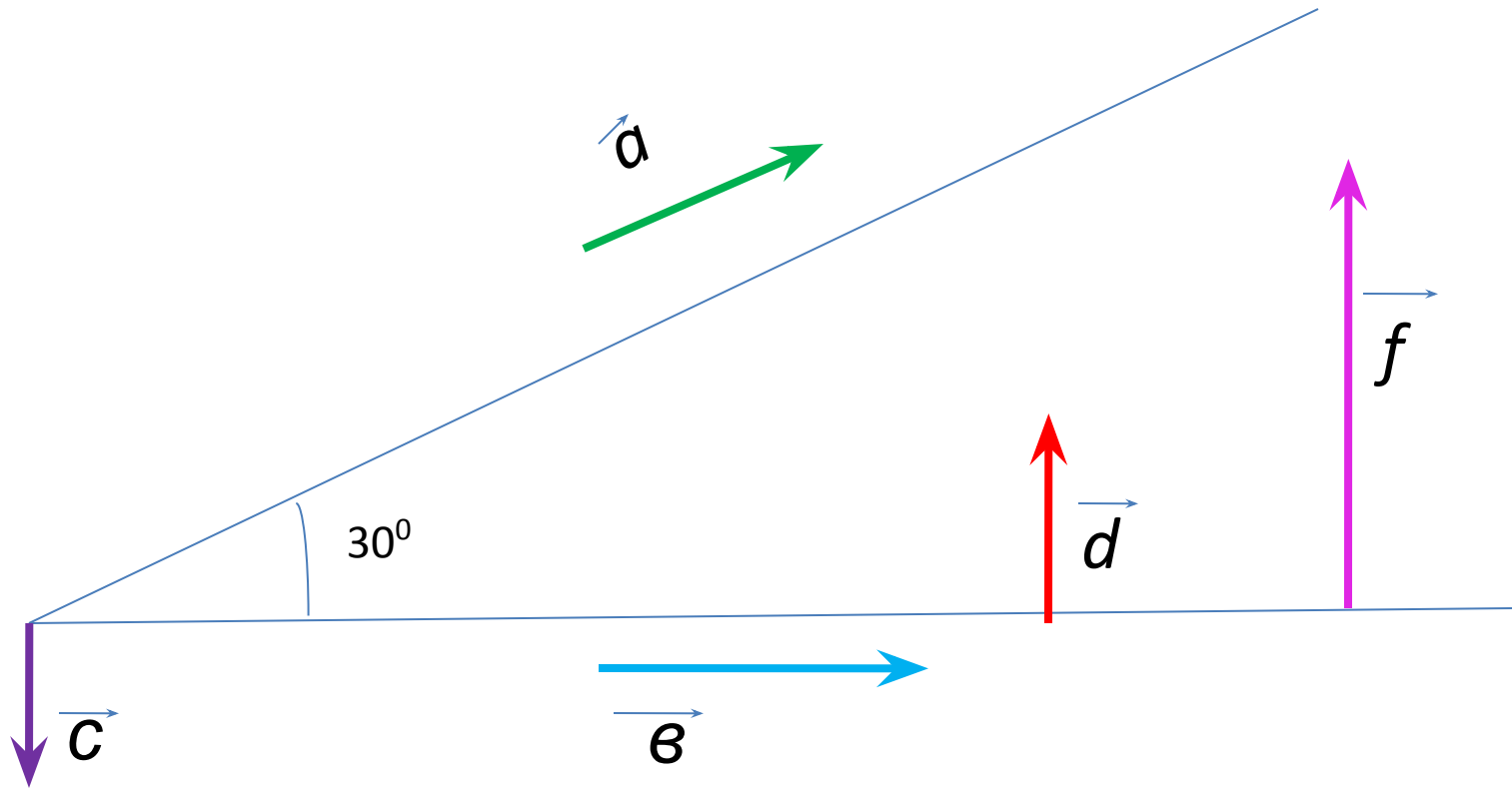
$$\vec{a} \wedge \vec{b} = 30^\circ$$



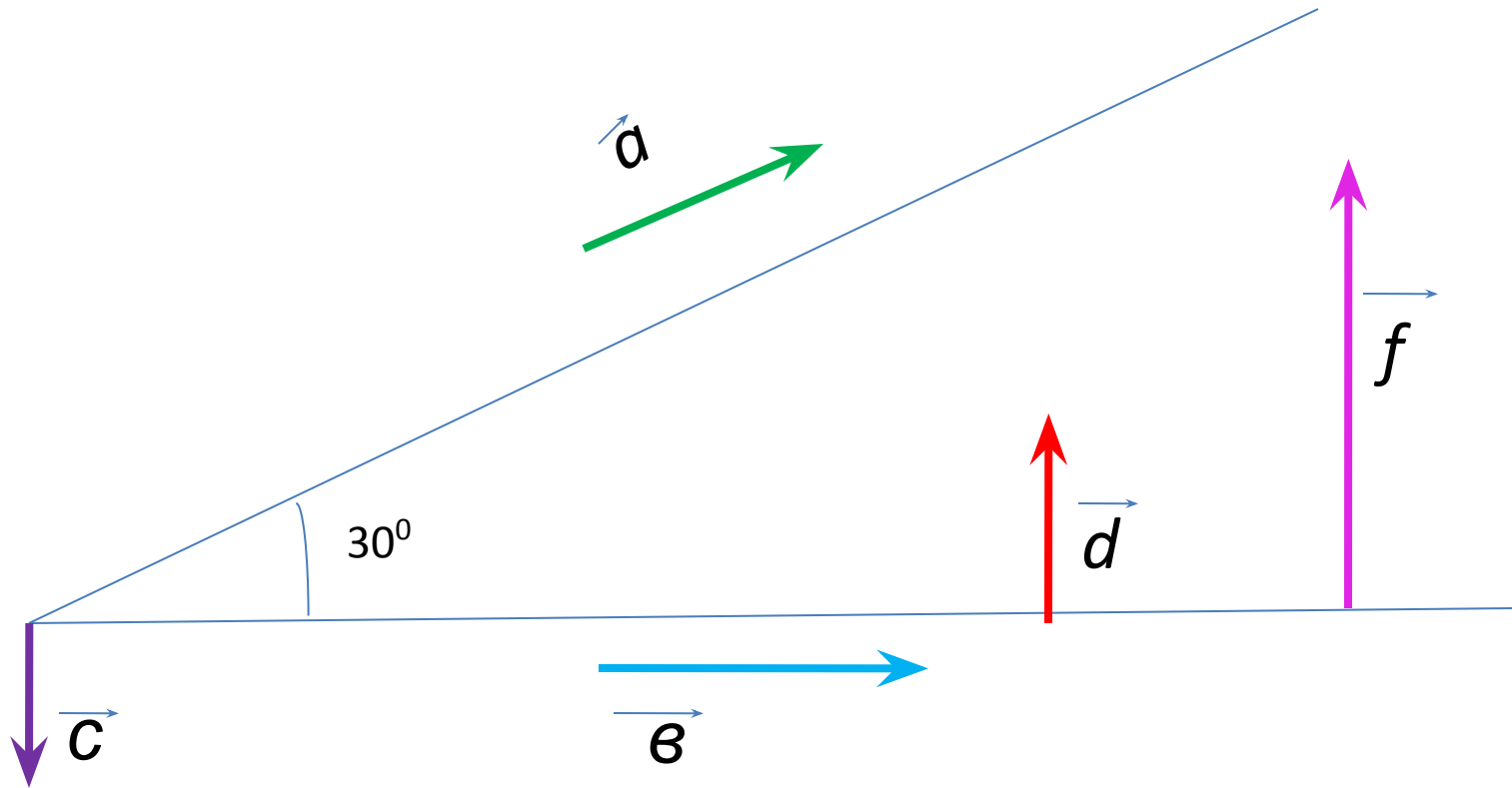
$$\vec{d} \wedge \vec{c} = 120^\circ$$



$$\vec{d} \wedge \vec{f} = \mathbf{0}^0$$



$$\vec{d} \wedge \vec{c} = 180^\circ$$



$$\angle a \wedge b = 30^\circ \quad \angle a \wedge c = 120^\circ \quad \angle b \wedge c = 90^\circ$$

$$\angle d \wedge f = 0^\circ \quad \angle d \wedge c = 180^\circ$$

$$b \perp c$$

$$b \perp d$$

$$b \perp f$$

2. Скалярное произведение векторов.

$$\vec{a} \cdot \vec{b} = |\vec{a}| \cdot |\vec{b}| \cdot \cos \angle \vec{a} \vec{b}$$

Законы:

$$1) \vec{a} \cdot \vec{b} = 0 \Leftrightarrow \vec{a} \perp \vec{b}$$

$$2) \vec{a} \cdot \vec{b} > 0 \Leftrightarrow 0 \leq (\vec{a}, \vec{b}) < 90$$

$$3) \vec{a} \cdot \vec{b} < 0 \Leftrightarrow 90 < (\vec{a}, \vec{b}) \leq 180$$

$$4) \vec{a} \cdot \vec{b} = |\vec{a}| \cdot |\vec{b}| \Leftrightarrow \vec{a} \wedge \vec{b} = 0$$

$$5) \vec{a} \cdot \vec{a} = a^2 = |\vec{a}|^2$$