$$\vec{r} = \alpha t\vec{i} + \beta t^2\vec{j}$$

$$x = \alpha t$$

$$y = \beta t^2$$

$$\vec{v} = \frac{d\vec{r}}{dt} = \alpha\vec{i} + 2\beta t\vec{j}$$

$$v = \sqrt{\alpha^2 + 4\beta^2 t^2}$$

$$\vec{a} = \frac{d\vec{v}}{dt} = 0\vec{i} + 2\beta\vec{j} = 2\beta\vec{j}$$

$$a = \sqrt{0^2 + 4\beta^2} = 2\beta$$

$$\phi = \vec{v}\,\hat{}\,\vec{a}$$

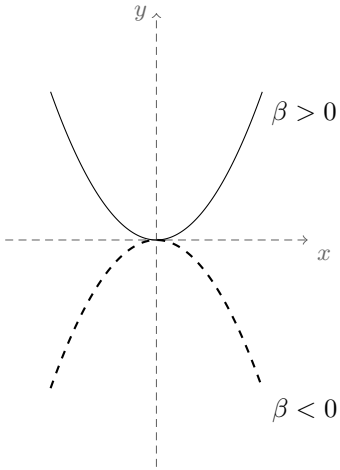
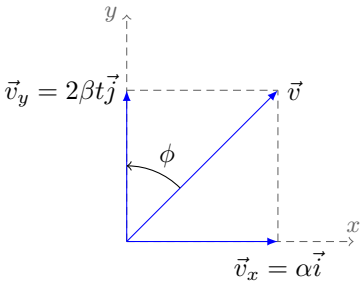


Рис. 1. График траектории



$$t = \frac{x}{\alpha}$$

$$y = \beta \cdot \frac{x^2}{\alpha^2} = \frac{\beta}{\alpha^2}x^2 \text{ – парабола}$$

Так как ускорение направлено по оси y ($\vec{a} = 2\beta\vec{j}$), то $\vec{v}\,\hat{}\,\vec{a} = \vec{v}\,\hat{}\,\vec{v_y}$.

$$\operatorname{tg}\phi = \frac{v_x}{v_y} = \frac{\alpha}{2\beta t}$$