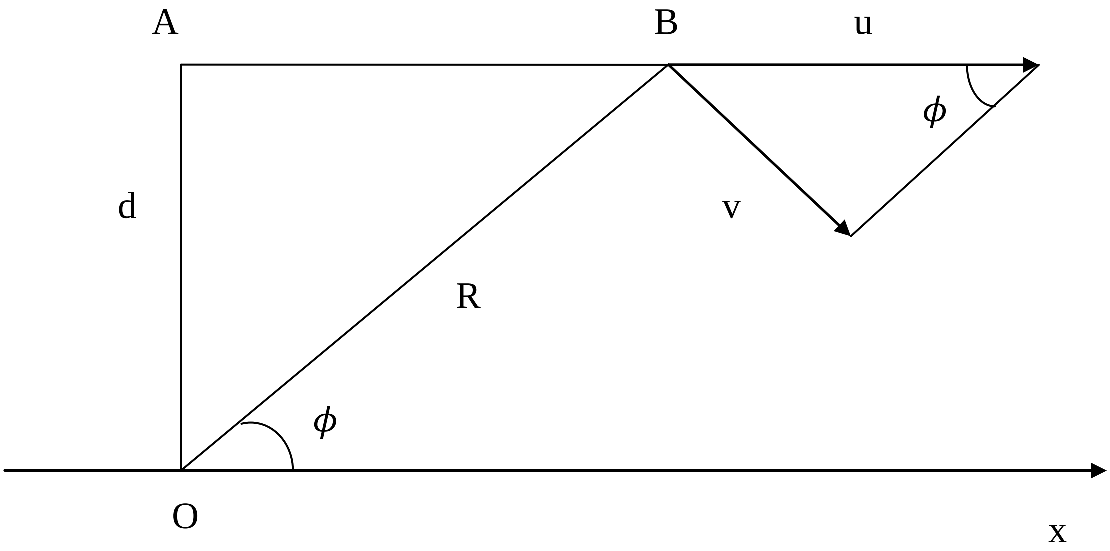

Suppose the particle has coordinates (R, ϕ) at some moment t. The formula for radial acceleration is:

$$a = \frac{v^2}{R}$$

where v is a tangential velocity.

As v is perpendicular to OB (because it is tangential velocity), we get from the scheme that:

$$v = u \sin \phi$$

Then

$$a(R, \phi) = \frac{u^2 \sin^2 \phi}{R}$$

If we assume that at the moment $t_0 = 0$ the particle was at the point A (just in opposite to the origin), then it was at the point B at some moment t and $AB = ut$.

Then we get:

$$R = \sqrt{u^2 t^2 + d^2}$$

and

$$\tan\phi = \frac{d}{ut}$$

So, $\sin^2\phi = 1 - \cos^2\phi = 1 - \frac{1}{1+\tan^2\phi} = \frac{\tan^2\phi}{1+\tan^2\phi} = \frac{d^2}{u^2t^2+d^2}$.

Finally,

$$a(t) = \frac{u^2}{\sqrt{u^2t^2+d^2}} * \frac{d^2}{u^2t^2+d^2} = \frac{u^2d^2}{(u^2t^2+d^2)^{\frac{3}{2}}}$$