

23.4: Relations between Circular and Linear Motion

It's a simple matter to derive some very useful relations between circular and linear motion. We begin with the relation between arc length s and angle θ (in radians) for a circle of radius r :

$$s = r\theta. \quad (23.4.1)$$

Taking the derivative with respect to time of both sides gives a relation between linear velocity $v = ds/dt$ and angular velocity $\omega = d\theta/dt$:

$$v = r\omega \quad (23.4.2)$$

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