

## 8.6: Inverse Relations

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Given the definition of (instantaneous) velocity

$$v = \frac{dx}{dt} \quad (8.6.1)$$

we can invert this by multiplying both sides by  $dt$  and integrating to get an expression for  $x(t)$  : it is the integral of velocity  $v$  with respect to time  $t$  :

$$x(t) = \int v(t)dt. \quad (8.6.2)$$

Similarly, we can invert the definition of acceleration

$$a = \frac{dv}{dt} \quad (8.6.3)$$

to get

$$v(t) = \int a(t)dt \quad (8.6.4)$$

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