

1 5.7: Antiderivatives

F is an antiderivative of f if and only if

Antiderivative Rules:

| Derivative $f'(x)$ | Original Function $f(x)$ | Derivative $f'(x)$ | Original Function $f(x)$ |
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Examples:

Given $f'(x) = x + x^2 + 4 \sin x$:

a) Find $f(x)$

b) Find $f(x)$ if $f(0) = 0$

The velocity of a particle along a straight line is given by $v(t) = e^t - \frac{1}{1+t^2} + t^2$. If the initial position is 4, find the position function at any time t .

A projectile is fired from the top of a hill of height h kilometers with a speed of v_0 km/hr at an angle of θ . Neglecting air resistance, DERIVE formulas to find the position of the projectile at any time.

On Your Own:

Given $f''(x) = \frac{1}{x^2} + e^x - 2$, $f'(1) = 0$, $f(1) = 1$, find $f(x)$.

$$f(x) = -\ln x + e^x - x^2 + (3 - e)x - 2$$