Calculus I
Antiderivatives of a function, part 1

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Example

Find all functions g such that

$$g'(x) = 4\sin x + \frac{2x^5 - \sqrt{x}}{x}.$$

Rewrite:

$$g'(x) = 4\sin x + 2\frac{x^5}{x} - \frac{\sqrt{x}}{x} = 4\sin x + 2x^4 - \frac{1}{\sqrt{x}}$$

Find the antiderivative:

$$g'(x) = 4\sin x + 2x^4 - \frac{1}{\sqrt{x}}$$

$$g(x) = 4(-\cos x) + 2\frac{x^5}{5} - \frac{x^{1/2}}{\frac{1}{2}} + C$$

$$= -4\cos x + \frac{2}{5}x^5 - 2\sqrt{x} + C$$