Mathematica Reference Sheet for Physics

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This PDF contains instructions on how to use Mathmatica to do mathematical calculations that I've used at least somewhat frequently while doing my undergraduate physics degree. Still a work in progress. You are to free to use/edit it as you see fit.

Contents

1 Differentiation

Example: $\frac{\partial}{\partial r}[\frac{1}{\sqrt{r^2-\epsilon^2}}]$

In Mathematica:

```
D[1/Sqrt[r^2 + e^2], r]
```

2 Integration

Definite Single Integral:

Example: $\int_1^4 \frac{x^2+y^2}{2\pi}\,dy = \frac{21}{2\pi} + \frac{3x^2}{2\pi}$

In Mathematica:

```
Integrate[ (x^2 + y^2)/(2*Pi), {y,1,4} ]
```