Review

1. When approaching a physics problem split it into 3 steps

i) Translating the physical situation into a mathematical expression
ii) applying techniques to solve the mathematical expression
iii) interpreting your solution.

2. Input - Piecewise[{{function1,range1},{function2, range2},..,{function-N, range-N}},value at other points]

3.Differentiate: Dt[f[x], x]
Integrate[f[x], x]

Fractions

$$\frac{1}{x^3+1}$$

Avoid:

```
In[1]:= 1 / x^3 + 1
```

$$1 + \frac{1}{x^3}$$

Out[1]=

Can do:

```
1 / (x^3 + 1)
```

$$\frac{1}{1+x^3}$$

'ctrl' + '/' for $\frac{1}{\text{fraction}}$

```
In[2]:= 1/(x^3 + 1)
```

$$\frac{1}{1+x^3}$$

Out[2]=

Here I also used 'ctrl' + '6' to input x^3

Simplify

In[4]:=
```
f[x_] = Integrate[1/(1 + x^3), x]
```

Out[4]=
$$\frac{\text{ArcTan}\left[\frac{-1+2x}{\sqrt{3}}\right]}{\sqrt{3}} + \frac{1}{3}\text{Log}[1+x] - \frac{1}{6}\text{Log}\left[1-x+x^2\right]$$

In[22]:=
```
solution = Dt[f[x], x]
```

Out[22]=
$$\frac{1}{3\,(1+x)} - \frac{-1+2x}{6\left(1-x+x^2\right)} + \frac{2}{3\left(1+\frac{1}{3}(-1+2x)^2\right)}$$

In[9]:=
```
Simplify[solution]
```

Out[9]=
$$\frac{1}{1+x^3}$$

Additional Information

```
Sin[2 π * n] + Cos[2 π * n]
```

```
Cos[2 n π] + Sin[2 n π]
```

```
Simplify[Sin[2 π * n] + Cos[2 π * n], n ∈ Integers]
```

```
1
```

‘esc’ el ‘esc’

```
∈
```

‘esc’ p ‘esc’

```
π
```

```
π
```

Summary

1. Simplify[expression]

2. Simplify[expression, n ∈ Integers]

3. Inputing symbols

a) ‘ctrl’ + ‘/’

b) ‘esc’ el ‘esc’