

Feynman Data

```
In[ ]:= dir=NotebookDirectory[]
```

```
Out[ ]:=  
/Users/nathanhaut/Library/Mobile  
Documents/com~apple~CloudDocs/MSU/Research/Feynman Data/
```

```
In[ ]:= GenerateData[func_, ranges_, eqNum_] := Block[  
    {trainInput, trainResponse, fullTrain, train, testInput, testResponse, fullTest, test},  
  
    (*Training Data*)  
    trainInput = RandomReal[#, 100] & /@ ranges;  
    trainResponse = func[#, . (List → Sequence)] & /@ Transpose[trainInput];  
    fullTrain = Transpose[Append[trainInput, trainResponse]];  
    train = Prepend[fullTrain, Append[Table["x" <> ToString@i, {i, 1, Length@ranges}], "y"]];  
    Export[dir <> ToString[eqNum] <> "_Train.csv", train];  
  
    (*Testing Data*)  
    testInput = RandomReal[#, 100] & /@ ranges;  
    testResponse = func[#, . (List → Sequence)] & /@ Transpose[testInput];  
    fullTest = Transpose[Append[testInput, testResponse]];  
    test = Prepend[fullTest, Append[Table["x" <> ToString@i, {i, 1, Length@ranges}], "y"]];  
    Export[dir <> ToString[eqNum] <> "_Test.csv", test];  
  
]
```

EQ 1: $\frac{e^{\left(\frac{-\theta^2}{2}\right)}}{\sqrt{2 \cdot \pi}}$

```
In[ ]:= Clear[f]
```

$$f[\theta_] := \frac{E^{\left(\frac{-\theta^2}{2}\right)}}{\text{Sqrt}[2 \cdot \pi]}$$

```
In[ ]:= GenerateData[f, {{1, 3}}, 1]
```

$$\text{EQ 2: } \frac{E\left(\frac{-(\theta/\sigma)^2}{2}\right)}{\text{Sqrt}(2*\pi)*\sigma}$$

```
In[ ]:= Clear[f]
```

$$\text{In[]:= } f[\theta_, \sigma_] := \frac{E\left(\frac{-(\theta/\sigma)^2}{2}\right)}{\text{Sqrt}(2*\pi)*\sigma}$$

```
In[ ]:= GenerateData[f, {{1, 3}, {1, 3}}, 2]
```

$$\text{EQ 3: } \frac{E\left(\frac{-((\theta-\theta_1)/\sigma)^2}{2}\right)}{\text{Sqrt}(2*\pi)*\sigma}$$

```
In[ ]:= Clear[f]
```

$$\text{In[]:= } f[\theta_, \theta_1_, \sigma_] := \frac{E\left(\frac{-((\theta-\theta_1)/\sigma)^2}{2}\right)}{\text{Sqrt}[2*\pi]*\sigma}$$

```
In[ ]:= GenerateData[f, {{1, 3}, {1, 3}, {1, 3}}, 3]
```

$$\text{EQ 4: } \text{Sqrt}[(x_2 - x_1)^2 + (y_2 - y_1)^2]$$

```
In[ ]:= Clear[f]
```

$$\text{In[]:= } f[x1_, x2_, y1_, y2_] := \text{Sqrt}[(x2 - x1)^2 + (y2 - y1)^2]$$

```
In[ ]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 4]
```

$$\text{EQ 5: } \frac{G*m_1*m_2}{(x_2-x_1)^2 + (y_2-y_1)^2 + (z_2-z_1)^2}$$

```
In[ ]:= Clear[f]
```

$$\text{In[]:= } f[G_, m1_, m2_, x1_, x2_, y1_, y2_, z1_, z2_] := \frac{G*m1*m2}{(x2-x1)^2 + (y2-y1)^2 + (z2-z1)^2}$$

```
In[ ]:= GenerateData[f,
  {{1, 2}, {1, 2}, {1, 2}, {3, 4}, {1, 2}, {3, 4}, {1, 2}, {3, 4}, {1, 2}}, 5]
```

$$\text{EQ 6: } \frac{m_0}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$$

```
In[ ]:= Clear[f]
```

$$\text{In[*]:= } f[m_, v_, c_] := \frac{m}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$$

`In[*]:= GenerateData[f, {{1, 5}, {1, 2}, {3, 10}}, 6]`

EQ 7: $x_1 y_1 + x_2 y_2 + x_3 y_3$

`In[*]:= Clear[f]`

$$\text{In[*]:= } f[x1_, x2_, x3_, y1_, y2_, y3_] := x1 * y1 + x2 * y2 + x3 * y3$$

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 7]`

EQ 8: $\mu * N_n$

`In[*]:= Clear[f]`

$$\text{In[*]:= } f[\mu_, N_] := \mu * N$$

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 8]`

EQ 9: $\frac{1}{2} m * (v^2 + u^2 + w^2)$

`In[*]:= Clear[f]`

$$\text{In[*]:= } f[m_, v_, u_, w_] := \frac{1}{2} m * (v^2 + u^2 + w^2)$$

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 9]`

EQ 10: $\frac{q1 * q2 * r}{4 * \pi * \epsilon * r^3}$

`In[*]:= Clear[f]`

$$\text{In[*]:= } f[q1_, q2_, r_, \epsilon_] := \frac{q1 * q2 * r}{4 * \pi * \epsilon * r^3}$$

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 10]`

EQ 11: $\frac{q1 * r}{4 * \pi * \epsilon * r^3}$

`In[*]:= Clear[f]`

$$\text{In[*]:= } f[q1_, r_, \epsilon_] := \frac{q1 * r}{4 * \pi * \epsilon * r^3}$$

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 11]
```

EQ 12: $q_2 * E_f$

```
In[*]:= Clear[f]
```

```
In[*]:= f[q2_, E_] := q2 * E
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 12]
```

EQ 13: $q * (E_f + B * v * \text{Sin}[\theta])$

```
In[*]:= Clear[f]
```

```
In[*]:= f[q_, e_, B_, v_, \theta_] := q * (e + B * v * Sin[\theta])
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 13]
```

EQ 14: $G * m_1 * m_2 * \left(\frac{1}{r_2} - \frac{1}{r_1} \right)$

```
In[*]:= Clear[f]
```

```
In[*]:= f[G_, m1_, m2_, r1_, r2_] := G * m1 * m2 *  $\left( \frac{1}{r_2} - \frac{1}{r_1} \right)$ 
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 14]
```

EQ 15: $m * g * z$

```
In[*]:= Clear[f]
```

```
In[*]:= f[m_, g_, z_] := m * g * z
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 15]
```

EQ 16: $\frac{1}{2} * k * x^2$

```
In[*]:= Clear[f]
```

```
In[*]:= f[k_, x_] :=  $\frac{1}{2} * k * x^2$ 
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 16]
```

EQ 17: $\frac{x - u * t}{\text{Sqrt}\left[1 - \frac{u^2}{c^2}\right]}$

In[*]:= Clear[f]

In[*]:= f[x_, u_, c_, t_] := $\frac{x - u * t}{\text{Sqrt}\left[1 - \frac{u^2}{c^2}\right]}$

In[*]:= GenerateData[f, {{5, 10}, {1, 2}, {3, 20}, {1, 2}}, 17]

EQ 18: $\frac{t - u * \frac{x}{c^2}}{\text{Sqrt}\left[1 - \frac{u^2}{c^2}\right]}$

In[*]:= Clear[f]

In[*]:= f[t_, u_, c_, x_] := $\frac{t - u * \frac{x}{c^2}}{\text{Sqrt}\left[1 - \frac{u^2}{c^2}\right]}$

In[*]:= GenerateData[f, {{1, 5}, {1, 2}, {3, 10}, {1, 5}}, 18]

EQ 19: $\frac{m * v}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$

In[*]:= Clear[f]

In[*]:= f[m_, v_, c_] := $\frac{m * v}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$

In[*]:= GenerateData[f, {{1, 5}, {1, 2}, {3, 10}}, 19]

EQ 20: $\frac{u + v}{1 + u * \frac{v}{c^2}}$

In[*]:= Clear[f]

In[*]:= f[u_, v_, c_] := $\frac{u + v}{1 + u * \frac{v}{c^2}}$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 20]

EQ 21: $\frac{m1 * r1 + m2 * r2}{m1 + m2}$

In[*]:= Clear[f]

```
In[*]:= f[m1_, m2_, r1_, r2_] := 
$$\frac{m1 * r1 + m2 * r2}{m1 + m2}$$

```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 21]
```

EQ 22: $r * f * \sin[\theta]$

```
In[*]:= Clear[f]
```

```
In[*]:= f[r_, f_,  $\theta$ _] := r * f * Sin[ $\theta$ ]
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 22]
```

EQ 23: $m * r * v * \sin[\theta]$

```
In[*]:= Clear[f]
```

```
In[*]:= f[m_, r_, v_,  $\theta$ _] := m * r * v * Sin[ $\theta$ ]
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 23]
```

EQ 24: $\frac{1}{4} * m * (\omega^2 + \omega 1^2) * x^2$

```
In[*]:= Clear[f]
```

```
In[*]:= f[m_,  $\omega$ _,  $\omega 1$ _, x_] := 
$$\frac{1}{4} * m * (\omega^2 + \omega 1^2) * x^2$$

```

```
In[*]:= GenerateData[f, {{1, 3}, {1, 3}, {1, 3}, {1, 3}}, 24]
```

EQ 25: $\frac{q}{c}$

```
In[*]:= Clear[f]
```

```
In[*]:= f[q_, c_] := 
$$\frac{q}{c}$$

```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 25]
```

EQ 26: $\text{ArcSin}[n * \sin[\theta]]$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_,  $\theta$ _] := ArcSin[n * Sin[ $\theta$ ]]
```

```
In[*]:= GenerateData[f, {{0, 1}, {1, 5}}, 26]
```

EQ 27: $\frac{1}{\frac{1}{d1} + \frac{n}{d2}}$

In[]:= Clear[f]

In[]:= f[d1_, d2_, n_] := $\frac{1}{\frac{1}{d1} + \frac{n}{d2}}$

In[]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 27]

EQ 28: $\frac{\omega}{c}$

In[]:= Clear[f]

In[]:= f[ω_, c_] := $\frac{\omega}{c}$

In[]:= GenerateData[f, {{1, 10}, {1, 10}}, 28]

EQ 29: $\text{Sqrt}[x1^2 + x2^2 - 2 * x1 * x2 * \text{Cos}[\theta1 - \theta2]]$

In[]:= Clear[f]

In[]:= f[x1_, x2_, θ1_, θ2_] := $\text{Sqrt}[x1^2 + x2^2 - 2 * x1 * x2 * \text{Cos}[\theta1 - \theta2]]$

In[]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 29]

EQ 30: $L * \frac{\text{Sin}[n * \frac{\theta}{2}]^2}{\text{Sin}[\frac{\theta}{2}]^2}$

In[]:= Clear[f]

In[]:= f[L_, n_, θ_] := $L * \frac{\text{Sin}[n * \frac{\theta}{2}]^2}{\text{Sin}[\frac{\theta}{2}]^2}$

In[]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 30]

EQ 31: $\text{ArcSin}[\frac{\lambda}{n * d}]$

In[]:= Clear[f]

In[]:= f[λ_, n_, d_] := $\text{ArcSin}[\frac{\lambda}{n * d}]$

In[]:= GenerateData[f, {{1, 2}, {1, 5}, {2, 5}}, 31]

EQ 32: $\frac{q^2 a^2}{6 \pi \epsilon c^3}$

`In[*]:= Clear[f]`

`In[*]:= f[q_, a_, e_, c_] := $\frac{q^2 a^2}{6 \pi \epsilon c^3}$`

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 32]`

EQ 33: $\left(\frac{1}{2} \epsilon c E^2 \right) \left(8 \pi \frac{r^2}{3} \right) \left(\frac{\omega^4}{(\omega^2 - \omega_1^2)^2} \right)$

`In[*]:= Clear[f]`

`In[*]:= f[e_, c_, E1_, r_, w_, w1_] := $\left(\frac{1}{2} \epsilon c E_1^2 \right) \left(8 \pi \frac{r^2}{3} \right) \left(\frac{\omega^4}{(\omega^2 - \omega_1^2)^2} \right)$`

`In[*]:= GenerateData[f, {{1, 2}, {1, 2}, {1, 2}, {1, 2}, {1, 2}, {3, 5}}, 33]`

EQ 34: $\frac{q v B}{p}$

`In[*]:= Clear[f]`

`In[*]:= f[q_, v_, B_, p_] := $\frac{q v B}{p}$`

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 34]`

EQ 35: $\frac{\omega}{1 - \frac{v}{c}}$

`In[*]:= Clear[f]`

`In[*]:= f[w_, v_, c_] := $\frac{\omega}{1 - \frac{v}{c}}$`

`In[*]:= GenerateData[f, {{1, 5}, {1, 2}, {3, 10}}, 35]`

EQ 36: $\frac{1 + v/c}{\text{Sqrt}[1 - \frac{v^2}{c^2}]} * \omega$

`In[*]:= Clear[f]`

$$\text{In[*]:= } f[v_ , c_ , \omega_] := \frac{1 + v / c}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]} * \omega$$

`In[*]:= GenerateData[f, {{1, 2}, {3, 10}, {1, 5}}, 36]`

EQ 37: $h * \omega$

`In[*]:= Clear[f]`

`In[*]:= f[h_ , \omega_] := h * \omega`

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 37]`

EQ 38: $l_1 + l_2 + 2 * \text{Sqrt}[l_1 * l_2] * \text{Cos}[\delta]$

`In[*]:= Clear[f]`

`In[*]:= f[l1_ , l2_ , \delta_] := l1 + l2 + 2 * Sqrt[l1 * l2] * Cos[\delta]`

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 38]`

EQ 39: $\frac{4 * \pi * \epsilon * h^2}{m * q^2}$

`In[*]:= Clear[f]`

`In[*]:= f[\epsilon_ , h_ , m_ , q_] := \frac{4 * \pi * \epsilon * h^2}{m * q^2}`

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 39]`

EQ 40: $\frac{3}{2} * p * v$

`In[*]:= Clear[f]`

`In[*]:= f[p_ , v_] := \frac{3}{2} * p * v`

`In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 40]`

EQ 41: $\frac{1}{\gamma - 1} * p * v$

`In[*]:= Clear[f]`

`In[*]:= f[\gamma_ , p_ , v_] := \frac{1}{\gamma - 1} * p * v`

```
In[*]:= GenerateData[f, {{2, 5}, {1, 5}, {1, 5}}, 41]
```

EQ 42: $\frac{n * k * T}{v}$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, k_, T_, v_] :=  $\frac{n * k * T}{v}$ 
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 42]
```

EQ 43: $n * \text{Exp}\left[\frac{m * g * x}{k * T}\right]$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, m_, g_, x_, k_, T_] :=  $n * \text{Exp}\left[\frac{m * g * x}{k * T}\right]$ 
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 43]
```

EQ 44: $\frac{h * \omega^3}{\pi^2 * c^2 * (\text{Exp}\left[\frac{h * \omega}{k * T}\right] - 1)}$

```
In[*]:= Clear[f]
```

```
In[*]:= f[h_, \omega_, c_, k_, T_] :=  $\frac{h * \omega^3}{\pi^2 * c^2 * (\text{Exp}\left[\frac{h * \omega}{k * T}\right] - 1)}$ 
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 44]
```

EQ 45: $\frac{u * q * v}{d}$

```
In[*]:= Clear[f]
```

```
In[*]:= f[u_, q_, v_, d_] :=  $\frac{u * q * v}{d}$ 
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 45]
```

EQ 46: $u * k * T$

```
In[*]:= Clear[f]
```

```
In[*]:= f[u_, k_, T_] :=  $u * k * T$ 
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 46]
```

$$\text{EQ 47: } \frac{1}{\gamma - 1} * \frac{k * v}{A}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[γ_, k_, v_, A_] := 1/(γ - 1) * (k * v)/A
```

```
In[*]:= GenerateData[f, {{2, 5}, {1, 5}, {1, 5}, {1, 5}}, 47]
```

$$\text{EQ 48: } n * k * T * \text{Ln} \left[\frac{v_2}{v_1} \right]$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, k_, T_, v2_, v1_] := n * k * T * Log[v2/v1]
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 48]
```

$$\text{EQ 49: } \text{Sqrt} \left[\frac{\gamma * pr}{\rho} \right]$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[γ_, pr_, ρ_] := Sqrt[γ * pr / ρ]
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 49]
```

$$\text{EQ 50: } \frac{m * c^2}{\text{Sqrt} \left[1 - \frac{v^2}{c^2} \right]}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[m_, c_, v_] := (m * c^2) / Sqrt[1 - v^2/c^2]
```

```
In[*]:= GenerateData[f, {{1, 5}, {3, 10}, {1, 2}}, 50]
```

$$\text{EQ 51: } x_1 * \left(\text{Cos} [\omega * t] + \alpha * \text{Cos} [\omega * t]^2 \right)$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[x1_, ω_, t_, α_] := x1 * (Cos[ω * t] + α * Cos[ω * t]^2)
```

```
In[*]:= GenerateData[f, {{1, 3}, {1, 3}, {1, 3}, {1, 3}}, 51]
```

$$\text{EQ 52: } \frac{k (T_2 - T_1) A}{d}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[k_, T2_, T1_, A_, d_] := \frac{k (T2 - T1) A}{d}
```

```
In[*]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 52]
```

$$\text{EQ 53: } \frac{P}{4 \pi * r^2}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[P_, r_] := \frac{P}{4 \pi * r^2}
```

```
In[*]:= GenerateData[f, {{1, 5}}, {1, 5}}, 53]
```

$$\text{EQ 54: } \frac{q}{4 * \pi * \epsilon * r}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[q_, \epsilon_, r_] := \frac{q}{4 * \pi * \epsilon * r}
```

```
In[*]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}}, 54]
```

$$\text{EQ 55: } \frac{1}{4 * \pi * \epsilon} * \frac{p * \text{Cos}[\theta]}{r^2}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[\epsilon_, p_, \theta_, r_] := \frac{1}{4 * \pi * \epsilon} * \frac{p * \text{Cos}[\theta]}{r^2}
```

```
In[*]:= GenerateData[f, {{1, 3}}, {1, 3}, {1, 3}, {1, 3}}, 55]
```

$$\text{EQ 56: } \frac{3}{4 * \pi * \epsilon} * \frac{p * z}{r^5} * \text{Sqrt}[x^2 + y^2]$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[\epsilon_, p_, z_, r_, x_, y_] := \frac{3}{4 * \pi * \epsilon} * \frac{p * z}{r^5} * \text{Sqrt}[x^2 + y^2]
```

```
In[*]:= GenerateData[f, {{1, 3}}, {1, 3}, {1, 3}, {1, 3}, {1, 3}, {1, 3}}, 56]
```

EQ 57: $\frac{3}{4\pi\epsilon} * \frac{p}{r^3 * \text{Cos}[\theta] * \text{Sin}[\theta]}$

In[*]:= Clear[f]

In[*]:= f[$\epsilon_$, $p_$, $r_$, $\theta_$] := $\frac{3}{4\pi\epsilon} * \frac{p}{r^3 * \text{Cos}[\theta] * \text{Sin}[\theta]}$

In[*]:= GenerateData[f, {{1, 3}, {1, 3}, {1, 3}, {1, 3}}, 57]

EQ 58: $\frac{3}{5} * \frac{q^2}{4\pi\epsilon * d}$

In[*]:= Clear[f]

In[*]:= f[$q_$, $\epsilon_$, $d_$] := $\frac{3}{5} * \frac{q^2}{4\pi\epsilon * d}$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 58]

EQ 59: $\frac{\epsilon * E^2}{2}$

In[*]:= Clear[f]

In[*]:= f[$\epsilon_$, $e_$] := $\frac{\epsilon * e^2}{2}$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 59]

EQ 60: $\frac{\sigma}{\epsilon} * \frac{1}{1+\chi}$

In[*]:= Clear[f]

In[*]:= f[$\sigma_$, $\epsilon_$, $\chi_$] := $\frac{\sigma}{\epsilon} * \frac{1}{1+\chi}$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 60]

EQ 61: $\frac{q * E}{m * (\omega_0^2 + \omega^2)}$

In[*]:= Clear[f]

In[*]:= f[$q_$, $e_$, $m_$, $\omega_0_$, $\omega_$] := $\frac{q * e}{m * (\omega_0^2 + \omega^2)}$

In[*]:= GenerateData[f, {{1, 3}, {1, 3}, {1, 3}, {3, 5}, {1, 2}}, 61]

$$\text{EQ 62: } n * \left(1 + \frac{p * E * \text{Cos}[\theta]}{k * T} \right)$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, p_, e_, \theta_, k_, T_] := n * \left( 1 + \frac{p * e * \text{Cos}[\theta]}{k * T} \right)
```

```
In[*]:= GenerateData[f, {{1, 3}}, {1, 3}, {1, 3}, {1, 3}, {1, 3}, {1, 3}}, 62]
```

$$\text{EQ 63: } \frac{n * p^2 * E}{3 * k * T}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, p_, e_, k_, T_] := \frac{n * p^2 * e}{3 * k * T}
```

```
In[*]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 63]
```

$$\text{EQ 64: } \frac{n * \alpha}{1 - n * \frac{\alpha}{3}} * \epsilon * E$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, \alpha_, \epsilon_, e_] := \frac{n * \alpha}{1 - n * \frac{\alpha}{3}} * \epsilon * e
```

```
In[*]:= GenerateData[f, {{0, 1}}, {0, 1}, {1, 2}, {1, 2}}, 64]
```

$$\text{EQ 65: } 1 + \frac{n * \alpha}{1 - \left(n * \frac{\alpha}{3} \right)}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, \alpha_] := 1 + \frac{n * \alpha}{1 - \left( n * \frac{\alpha}{3} \right)}
```

```
In[*]:= GenerateData[f, {{0, 1}}, {0, 1}}, 65]
```

$$\text{EQ 66: } \frac{1}{4 * \pi * \epsilon * c^2} * \frac{2 * l}{r}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[\epsilon_, c_, l_, r_] := \frac{1}{4 * \pi * \epsilon * c^2} * \frac{2 * l}{r}
```

```
In[*]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}, {1, 5}}, 66]
```

EQ 67: $\frac{p}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$

In[]:= Clear[f]

In[]:= f[p_, v_, c_] := $\frac{p}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$

In[]:= GenerateData[f, {{1, 5}, {1, 2}, {3, 10}}, 67]

EQ 68: $\frac{p*v}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$

In[]:= Clear[f]

In[]:= f[p_, v_, c_] := $\frac{p*v}{\text{Sqrt}\left[1 - \frac{v^2}{c^2}\right]}$

In[]:= GenerateData[f, {{1, 5}, {1, 2}, {3, 10}}, 68]

EQ 69: $-u*B*\text{Cos}[\theta]$

In[]:= Clear[f]

In[]:= f[u_, B_, θ] := $-u*B*\text{Cos}[\theta]$

In[]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 69]

EQ 70: $-p*E*\text{Cos}[\theta]$

In[]:= Clear[f]

In[]:= f[p_, e_, θ] := $-p*e*\text{Cos}[\theta]$

In[]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 70]

EQ 71: $\frac{q}{4*\pi*\epsilon*r*(1-v/c)}$

In[]:= Clear[f]

In[]:= f[q_, ϵ _, r_, v_, c_] := $\frac{q}{4*\pi*\epsilon*r*(1-v/c)}$

In[]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 2}, {3, 10}}, 71]

$$\text{EQ 72: Sqrt} \left[\frac{\omega^2}{c^2 - \frac{\pi^2}{d^2}} \right]$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[ω_, c_, d_] := Sqrt[ $\frac{\omega^2}{c^2 - \frac{\pi^2}{d^2}}$ ]
```

```
In[ ]:= GenerateData[f, {{2, 4}, {4, 6}, {1, 2}}, 72]
```

$$\text{EQ 73: } \epsilon * c * E^2$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[ε_, c_, e_] := ε * c * e^2
```

```
In[ ]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 73]
```

$$\text{EQ 74: } \epsilon * E^2$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[ε_, e_] := ε * e^2
```

```
In[ ]:= GenerateData[f, {{1, 5}, {1, 5}}, 74]
```

$$\text{EQ 75: } \frac{q * v}{2 * \pi * r}$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[q_, v_, r_] :=  $\frac{q * v}{2 * \pi * r}$ 
```

```
In[ ]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 75]
```

$$\text{EQ 76: } q * v * r / 2$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[q_, v_, r_] := q * v * r / 2
```

```
In[ ]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 76]
```

EQ 77: $\frac{g * q * B}{2 * m}$

In[*]:= Clear[f]

In[*]:= f[g_, q_, B_, m_] := $\frac{g * q * B}{2 * m}$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 77]

EQ 78: $\frac{q * h}{4 * \pi * m}$

In[*]:= Clear[f]

In[*]:= f[q_, h_, m_] := $\frac{q * h}{4 * \pi * m}$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 78]

EQ 79: $\frac{g * u * B * J}{\hbar}$

In[*]:= Clear[f]

In[*]:= f[g_, u_, B_, J_, h_] := $\frac{g * u * B * J}{\hbar}$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 79]

EQ 80: $\frac{n}{\text{Exp}\left[\frac{u * B}{k * T}\right] + \text{Exp}\left[\frac{-u * B}{k * T}\right]}$

In[*]:= Clear[f]

In[*]:= f[n_, u_, B_, k_, T_] := $\frac{n}{\text{Exp}\left[\frac{u * B}{k * T}\right] + \text{Exp}\left[\frac{-u * B}{k * T}\right]}$

In[*]:= GenerateData[f, {{1, 3}, {1, 3}, {1, 3}, {1, 3}, {1, 3}}, 80]

EQ 81: $n * u * \text{Tanh}\left[\frac{u * B}{k * T}\right]$

In[*]:= Clear[f]

In[*]:= f[n_, u_, B_, k_, T_] := $n * u * \text{Tanh}\left[\frac{u * B}{k * T}\right]$

In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 81]

$$\text{EQ 82: } \frac{u * B}{k * T} + \frac{u * \alpha * M}{\epsilon * c^2 * k * T}$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[u_, B_, k_, T_, α_, M_, ε_, c_] := \frac{u * B}{k * T} + \frac{u * α * M}{ε * c^2 * k * T}
```

```
In[ ]:= GenerateData[f, {{1, 3}}, {1, 3}, {1, 3}, {1, 3}, {1, 3}, {1, 3}, {1, 3}, {1, 3}, {1, 3}}, 82]
```

$$\text{EQ 83: } u * (1 + \chi) * B$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[u_, χ_, B_] := u * (1 + χ) * B
```

```
In[ ]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}}, 83]
```

$$\text{EQ 84: } \frac{Y * A * x}{d}$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[Y_, A_, x_, d_] := \frac{Y * A * x}{d}
```

```
In[ ]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}, {1, 5}}, 84]
```

$$\text{EQ 85: } \frac{Y}{2 * (1 + \sigma)}$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[Y_, σ_] := \frac{Y}{2 * (1 + σ)}
```

```
In[ ]:= GenerateData[f, {{1, 5}}, {1, 5}}, 85]
```

$$\text{EQ 86: } \frac{1}{\text{Exp}\left[\frac{\hbar * \omega}{k * T}\right] - 1}$$

```
In[ ]:= Clear[f]
```

```
In[ ]:= f[ħ_, ω_, k_, T_] := \frac{1}{\text{Exp}\left[\frac{\hbar * \omega}{k * T}\right] - 1}
```

```
In[ ]:= GenerateData[f, {{1, 5}}, {1, 3}, {1, 3}, {1, 3}}, 86]
```

$$\text{EQ 87: } \frac{\hbar * \omega}{\text{Exp}\left[\frac{\hbar * \omega}{k * T}\right] - 1}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[h_, w_, k_, T_] := 
$$\frac{\hbar * \omega}{\text{Exp}\left[\frac{\hbar * \omega}{k * T}\right] - 1}$$

```

```
In[*]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}, {1, 5}}, 87]
```

$$\text{EQ 88: } \frac{2 * u * B}{\hbar}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[u_, B_, h_] := 
$$\frac{2 * u * B}{\hbar}$$

```

```
In[*]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}}, 88]
```

$$\text{EQ 89: } \text{Sin}\left[\frac{e * t}{\hbar}\right]^2$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[e_, t_, h_] := 
$$\text{Sin}\left[\frac{e * t}{\hbar}\right]^2$$

```

```
In[*]:= GenerateData[f, {{1, 2}}, {1, 2}, {1, 4}}, 89]
```

$$\text{EQ 90: } \frac{p * E * t}{\hbar} * \frac{\text{Sin}\left[\frac{(\omega - \omega_0) * t}{2}\right]^2}{\left(\frac{(\omega - \omega_0) * t}{2}\right)^2}$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[p_, e_, t_, h_, w_, w0_] := 
$$\frac{p * e * t}{\hbar} * \frac{\text{Sin}\left[\frac{(\omega - \omega_0) * t}{2}\right]^2}{\left(\frac{(\omega - \omega_0) * t}{2}\right)^2}$$

```

```
In[*]:= GenerateData[f, {{1, 3}}, {1, 3}, {1, 3}, {1, 3}, {1, 5}, {1, 5}}, 90]
```

$$\text{EQ 91: } u * \text{Sqrt}[Bx^2 + By^2 + Bz^2]$$

```
In[*]:= Clear[f]
```

```
In[*]:= f[u_, Bx_, By_, Bz_] := 
$$u * \text{Sqrt}[Bx^2 + By^2 + Bz^2]$$

```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 91]
```

EQ 92: $n \cdot \hbar$

```
In[*]:= Clear[f]
```

```
In[*]:= f[n_, h_] := n * h
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}}, 92]
```

EQ 93: $\frac{2 \cdot E \cdot d^2 \cdot k}{\hbar}$

```
In[*]:= Clear[f]
```

```
In[*]:= f[e_, d_, k_, h_] := 
$$\frac{2 \cdot e \cdot d^2 \cdot k}{\hbar}$$

```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}, {1, 5}}, 93]
```

EQ 94: $l \cdot \left(\text{Exp} \left[\frac{q \cdot V}{k \cdot T} \right] - 1 \right)$

```
In[*]:= Clear[f]
```

```
In[*]:= f[l_, q_, V_, k_, T_] := l * 
$$\left( \text{Exp} \left[ \frac{q \cdot V}{k \cdot T} \right] - 1 \right)$$

```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 2}, {1, 2}, {1, 2}, {1, 2}}, 94]
```

EQ 95: $2 \cdot U \cdot (1 - \text{Cos}[k \cdot d])$

```
In[*]:= Clear[f]
```

```
In[*]:= f[U_, k_, d_] := 2 * U * (1 - Cos[k * d])
```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 95]
```

EQ 96: $\frac{\hbar^2}{2 \cdot E \cdot d^2}$

```
In[*]:= Clear[f]
```

```
In[*]:= f[h_, e_, d_] := 
$$\frac{\hbar^2}{2 \cdot e \cdot d^2}$$

```

```
In[*]:= GenerateData[f, {{1, 5}, {1, 5}, {1, 5}}, 96]
```

EQ 97: $\frac{2 \star \pi \star \alpha}{n \star d}$

`In[]:= Clear[f]`

`In[]:= f[α_, n_, d_] := $\frac{2 \star \pi \star \alpha}{n \star d}$`

`In[]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}}, 97]`

EQ 98: $\beta \star (1 + \alpha \star \text{Cos}[\theta])$

`In[]:= Clear[f]`

`In[]:= f[β_, α_, θ_] := β ⋆ (1 + α ⋆ Cos[θ])`

`In[]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}}, 98]`

EQ 99: $\frac{-m \star q^4}{2 \star (4 \pi \star \epsilon)^2 \hbar^2} \star \frac{1}{n^2}$

`In[]:= Clear[f]`

`In[]:= f[m_, q_, ε_, ħ_, n_] := $\frac{-m \star q^4}{2 \star (4 \pi \star \epsilon)^2 \hbar^2} \star \frac{1}{n^2}$`

`In[]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}, {1, 5}, {1, 5}}, 99]`

EQ 100: $\frac{-p \star q \star A}{m}$

`In[]:= Clear[f]`

`In[]:= f[p_, q_, A_, m_] := $\frac{-p \star q \star A}{m}$`

`In[]:= GenerateData[f, {{1, 5}}, {1, 5}, {1, 5}, {1, 5}}, 100]`