Física Aplicada I

Calcular cual de los siguientes ecuaciones o formulas es correcta.

a) $P = P_0 + \frac{F}{A} g$

$[P] = [P_0] + [F][g]$

$\frac{ML}{T^2} = \frac{M}{L^3} L^x \frac{L}{T^2}$

$\frac{ML}{L T^2} = \frac{ML}{T^2 L^x} + \frac{M}{L^3} \frac{L}{T^2} L \quad \frac{ML}{T^2} = \frac{ML}{T^2}$

Incorrecto

b) $V = V_0 T + aT$

$[V] = [V][T] + [a][T]$

$\frac{L}{T} \quad \frac{L}{T} (T) + \left(\frac{L}{T^2}\right)(T)$

Incorrecto

(13) $\mathcal{E} = \gamma . U . g$

Formula correcta

(1) $F = M U R^2$

$F = \frac{MV}{R^2}$

$\frac{ML}{T^2} = \frac{M}{L} \left(\frac{L}{L^2}\right)$

$\frac{ML}{T^2} = \frac{ML}{T^2}$

Calcular los exponentes de las expresiones dadas.

a) $F = m^x V^y R^z$

$[F] = [m]^x [V]^y [R]^z$

$\frac{ML}{T^2} = (m)^x \left(\frac{L}{T}\right)^y (L)^z$

$\frac{ML}{T^2} = \frac{m^x}{T^y} L^y L^z$

$\frac{ML}{T^2} = \frac{m^x}{T^y} L^{y+z}$

$x = 1$

$y + z = 1$

$y = 2$

$2 + z = 1$

$z = 2 - 2$

$z = -1$

(3) $\mathcal{E} = m^x a^y V^z$

$[\mathcal{E}] = [m]^x [a]^y [V]^z$

$\frac{ML^2}{T^2} = (m)^x \left(\frac{L}{T^2}\right)^y \left(\frac{L}{T}\right)^z$

$\frac{ML^2}{T^2} = M^x \frac{L^y}{T^{2y}} \frac{L}{T^z}$

$\frac{ML}{T^2} = \frac{M^x L^{y+z}}{T^{2y+z}}$

$x = 1$

$y + z = 2$

$2y + z = 2$

Física Aplicada I

Calcular cual de los siguientes ecuaciones o formulas es correcta.

a) $P = P_0 + \frac{F g}{h}$

$[P] = [P_0] + [F][g]$

$\frac{ML}{LT^{2}} = \frac{ML}{T^2 L^2} + \frac{M}{L^3}\frac{L}{T^2}L$

Incorrecto

c) $V = V_0 T + aT$

$[V] = [V][T] + [a][T]$

$\frac{L}{T} \quad \frac{L}{T}(T) + \left(\frac{L}{T^2}\right)(T)$

Incorrecto

B) $\mathcal{E} = Y \cdot U \cdot g$

$\frac{ML}{T^2} = \frac{M}{L^3} L^2 \frac{L}{T^2}$

$\frac{ML}{T^2} = \frac{ML}{T^2}$

Formula correcta

D) $F = M V R^2$

$F = \frac{MV}{R^2}$

$\frac{ML}{T^2} = \frac{M}{L}\left(\frac{L}{L^2}\right)$

$\frac{ML}{T^2} = \frac{ML}{T^2}$

Calcular los exponentes de las expresiones dadas.

a) $F = m^x v^y R^z$

$[F] = [m]^x [v]^y [R]^z$

$\frac{ML}{T^2} = (m)^x \left(\frac{L}{T}\right)^y (L)^z$

$\frac{ML}{T^2} = \frac{m^x}{T^y} L^y L^z$

$\frac{ML}{T^2} = \frac{m^x L^{y+z}}{T^y}$

$x = 1$

$y + z = 1$

$y = 2$

$2 + z = 1$

$z = 1 - 2$

$z = -1$

b) $\mathcal{E} = m^x a^y v^z$

$[\mathcal{E}] = [m]^x [a]^y [v]^z$

$\frac{ML^2}{T^2} = (m)^x \left(\frac{L}{T^2}\right)^y \left(\frac{L}{T}\right)^z$

$\frac{ML^2}{T^2} = M^x \frac{L^y}{T^{2y}} \frac{L}{T^z}$

$\frac{ML}{T^2} = \frac{M^x L^{y+z}}{T^{2y+z}}$

$x = 1$

$y + z = 2$

$2y + z = 2$

c) $P = F^x V^y a^z$

$[P] = [F]^x [V]^y [a]^z$

$\frac{ML^2}{T^3} = \left(\frac{ML}{T^2}\right)^x \left(\frac{L}{T}\right)^y \left(\frac{L}{T}\right)^z$

$\frac{ML^2}{T^3} = \frac{M^x L^x}{T^{2x}} \frac{L^y}{T^y} \frac{L^z}{T^z}$

$\frac{ML^2}{T^3} = \frac{M^x L^{x+y+z}}{T^{2x+y+2z}}$

$y = 1$

$x + y + z = 2$

$2x + y + 2z = 3$

(1) $J = R^x F^y$

$[J] = [R]^x [F]^y$

$[J] = (L)^x \left(\frac{ML}{T^2}\right)^y$

$[J] = L^x \frac{M^y L^y}{T^{2y}}$

$[J] = \frac{L^{x+y} M^y}{T^{2y}}$

$\frac{ML^2}{T^2} = \frac{L^{x+y} M^y}{T^{2y}}$

$y = 1$

$x + y = 2$

$2y = 2$

$\frac{ML^2}{T^2} = \frac{ML^2}{T^2}$

Determinar las dimensiones de la constante indicada

a) $F = K^2 X$ ¿K? (B) $V = AT^2 + \frac{T^3}{B}$ ¿A, B?

$[K] = \frac{F}{X}$

$[K] = \frac{[F]}{[X]}$

$[K] = \frac{ML}{T^2 L}$

$[K] = \frac{M}{T^2}$

$[V] = [A][T^2] + \frac{[T^3]}{[B]}$

$\left[\frac{L}{T}\right] = \frac{[A]T^2}{\left[\frac{L}{T}\right]} + \frac{[T^3]}{\frac{[B]}{\frac{L}{T}}}$

$[A] = T^2 = \frac{L}{T}$

$[A] = \frac{L}{TT^2}$

$[A] = \frac{L}{T^3}$

$\frac{T^3}{[B]} \not\propto \frac{L}{T}$

$[B] = \frac{T^3 T}{L}$

$[B] = \frac{T^4}{L}$

c) $P = F^x v^y a^z$

$[P] = [F]^x [v]^y [a]^z$

$\frac{ML^2}{T^3} = \left(\frac{ML}{T^2}\right)^x \left(\frac{L}{T}\right)^y \left(\frac{L}{T}\right)^z$

$\frac{ML^2}{T^3} = \frac{M^x L^x}{T^{2x}} \frac{L^y}{T^y} \frac{L^z}{T^z}$

$\frac{ML^2}{T^3} = \frac{M^x L^{x+y+z}}{T^{2x+y+2z}}$

$y = 1$

$x + y + z = 2$

$2x + y + 2z = 3$

(1) $\sigma = R^x F^y$

$[\sigma] = [R]^x [F]^y$

$[\sigma] = (L)^x \left(\frac{ML}{T^2}\right)^y$

$[\sigma] = L^x \frac{M^y L^y}{T^{2y}}$

$[\sigma] = \frac{L^{x+y} M^y}{T^{2y}}$

$\frac{ML^2}{T^2} = \frac{L^{x+y} M^y}{T^{2y}}$

$y = 1$

$x + y = 2$

$2y = 2$

$\frac{ML^2}{T^2} = \frac{ML^2}{T^2}$

Determinar las dimensiones de la constante indicada

a) $F = K \cdot X$ ¿K?

$[K] = \frac{F}{X}$

$[K] = \frac{[F]}{[X]}$

$[K] = \frac{M\frac{L}{T^2}}{L}$

$[K] = \frac{ML}{T^2 L}$

$[K] = \frac{M}{T^2}$

(B) $V = AT^2 + \frac{T^3}{B}$ ¿A, B?

$[V] = [A][T^2] + \frac{[T^3]}{[B]}$

$[\frac{L}{T}] = [A]T^2 + \frac{[T^3]}{[B]}$

$\frac{[L]}{[T]} = [A]T^2 + \frac{[T^3]}{[B]}$

$\frac{L}{T} = [A]T^2 + \frac{[T^3]}{[B]}$

$[A] = T^2 = \frac{L}{T}$

$[A] = \frac{L}{TT^2}$

$[A] = \frac{L}{T^3}$

$\frac{T^3}{[B]} = \frac{L}{T}$

$[B] = \frac{T^3 T}{L}$

$[B] = \frac{T^4}{L}$

c) $F = G \frac{m_1 m_2}{R_2}$ ¿G?

$G = \frac{F R^2}{m' m^2}$

$G = \frac{[F][R]^2}{[m_1][m_2]}$

$G = \frac{\frac{ML}{T^2} L^2}{m \; m}$

$G = \frac{ML^3}{T^2 mx}$

$G = \frac{L^3}{T^2 m}$

① $F = K \frac{q_1 q_2}{R^2}$ ¿K?

$K = \frac{F R^2}{q \; q^2}$

$[K] = \frac{[F][R]^2}{[q][q_2]}$

$K = \frac{\frac{ML}{T^2} L^2}{q \; q}$

$[K] \; \frac{\frac{ML^3}{T^2} L^2}{(T)(T)}$

$K \; \frac{ML^2}{I^2 I}$