

1 (275) 1750 - 5.000 5.000 5.000

... - M , ... - L , ... - T : 1

$[F] = M \frac{L}{T^2}$: $[a] = \frac{L}{T^2}$:

$F = 28 \text{ gr} \frac{\text{cm}}{\text{s}^2} = 28 (10^{-3} \text{ kg}) \frac{10^{-2} \text{ m}}{\text{s}^2} = 2.8 \cdot 10^{-4} \text{ kg} \frac{\text{m}}{\text{s}^2}$: M.k.S - 2

$F = 28 \text{ gr} \frac{\text{cm}}{\text{s}^2} = 28 (10^{-6} \text{ ton}) \frac{(10^{-5} \text{ km})}{(\frac{\text{h}}{3600})^2} \approx 3.63 \text{ ton} \frac{\text{km}}{\text{h}^2}$:

(i) $\left[\frac{U^2 M}{L_1} \right] = \frac{\frac{L^2}{T^2} \cdot M}{L} = M \frac{L}{T^2} = [F]$ ✓ :

(ii) $\left[\frac{L_1^2}{\mu L_2 T^2} \right] = \frac{L^2}{M \cdot L \cdot T^2} = \frac{L}{M T^2} \neq [F]$ X

(iii) $\left[\frac{M U^4}{a L_2 L_1} \right] = \frac{M \cdot \frac{L^4}{T^4}}{\frac{L}{T^2} \cdot L \cdot L} = M \cdot \frac{L}{T^2} = [F]$ ✓

$\underline{a} + \underline{b} = (2, 1, 5) + (3, 0, -2) = (5, 1, 3)$

$\underline{a} \cdot \underline{b} = (2, 1, 5) \cdot (3, 0, -2) = 2 \cdot 3 + 1 \cdot 0 + 5 \cdot (-2) = -4$

$\underline{a} \times \underline{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & 1 & 5 \\ 3 & 0 & -2 \end{vmatrix} = (1 \cdot (-2) - 5 \cdot 0) \hat{i} - (2 \cdot (-2) - 5 \cdot 3) \hat{j} + (2 \cdot 0 - 1 \cdot 3) \hat{k}$

$= (-7, 19, -3)$

$$|A+B|^2 - |A-B|^2 \quad \text{1027} \quad \text{1027} \quad \text{3}$$

$$|A+B|^2 = (A+B) \cdot (A+B) = |A|^2 + 2A \cdot B + |B|^2$$

$$|A-B|^2 = (A-B) \cdot (A-B) = |A|^2 - 2A \cdot B + |B|^2$$

$$|A+B|^2 - |A-B|^2 = 4A \cdot B$$

1027 1027 $|A+B| = |A-B|$ \therefore $A \perp B$ 1027 1027 $A \cdot B = 0$ 1027

1027 $|A+B|^2 = |A-B|^2$

$$\frac{-5}{\cos^2(2-5x)}$$

10

4 10

4

$$e^x (\cos x - \sin x)$$

1

10x⁴ 10

$$-(2x-3) \sin(x^2-3x) e^{\cos(x^2-3x)}$$

5

25 \sin x \cos x 10

$$e^{-x} (\cos x - \sin x)$$

10

$\frac{3x^2-14x-3}{(3x-7)^2}$ 10

$$\sin(390^\circ) = \sin(360^\circ + 30^\circ) = \sin(30^\circ) = \frac{1}{2}$$

(i)

5

$$\cos(-150^\circ) = \cos(-180^\circ + 30^\circ) = \cos(30^\circ) = \frac{\sqrt{3}}{2}$$

(ii)

$$\cos 2x = 2 \cos^2 x - 1$$

(iii)

$$\cos x = \sqrt{\frac{1 + \cos(2x)}{2}}$$

$$\cos(15^\circ) = \sqrt{\frac{1 + \cos(30^\circ)}{2}} = \sqrt{\frac{1 + \frac{\sqrt{3}}{2}}{2}} \approx 0.97$$