

Physics  
Quiz # 13

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Q1.

(c)

Q2.

(a)

Q3.

(a)

$$H_O = mvr$$

$$r = \sqrt{3^2 + 4^2} = 5$$

$$\sin^{-1} \frac{4}{5} = 53.13^\circ, \sin^{-1} \frac{3}{5} = 36.87^\circ$$

$$53.13^\circ - 36.87^\circ = 16.26^\circ$$

$$v_{\perp} = 10 \times \sin 16.26^\circ = 2.8 \text{ m/s}$$

$$H_O = 2 \times 2.8 \times 5 = 28 \text{ kgm}^2/\text{s}$$

(b)

$$r = \sqrt{2^2 + 3^2} = \sqrt{13} \text{ m}$$

$$\sin^{-1} \frac{3}{\sqrt{13}} = 56.31^\circ, 56.31^\circ - 30^\circ = 26.31^\circ$$

$$v_{\perp} = 15 \times \sin 26.31^\circ = 6.65 \text{ m/s}$$

$$H_P = 2 \times 6.65 \times \sqrt{13} = 47.95 \text{ kgm}^2/\text{s}$$

P4.

$$M = 30t^2 \text{ N} \cdot \text{m}$$

$$t = 5, M = 30 \times 5^2 = 750 \text{ N} \cdot \text{m}$$

$$M = Fr = 60 \text{ N} \cdot \text{m}$$

$$L = 60 \times 5 = 300 \text{ kgm}^2 \text{ s}^{-1}$$

$$M_t = 750 + 60 = 810 \text{ N} \cdot \text{m}$$

$$L = 810 + 300 = 1110 \text{ kgm}^2/\text{s}$$

$$v = \frac{L}{mr} = \frac{1110}{150 \times 4} = 1.85 \text{ m/s}$$

