

27/03/25

ASSIGNMENT - VELOCITY OBSTACLES

1. Assumed velocities

$$V_A = 20 \text{ m/s } \hat{j}$$

$$V_B = 25 \text{ m/s } \left[\frac{3}{5} \hat{i} + \frac{4}{5} \hat{j} \right]$$

$$V_C = 40 \text{ m/s } \hat{i}$$

Assumed radii

$$r_A = r_B = r_C = 5 \text{ m}$$

Assumed position

$$A - \cancel{40\hat{i} + 150\hat{j}} \quad 40\hat{i} + 180\hat{j}$$

$$B - \cancel{140\hat{i} + 100\hat{j}} \quad 140\hat{i} + 100\hat{j}$$

$$C - \cancel{70\hat{i} + 40\hat{j}} \quad 70\hat{i} + 40\hat{j}$$

$$\text{Scale :- } 1 \text{ mm} = 1 \text{ m} = 1 \text{ m/s}$$

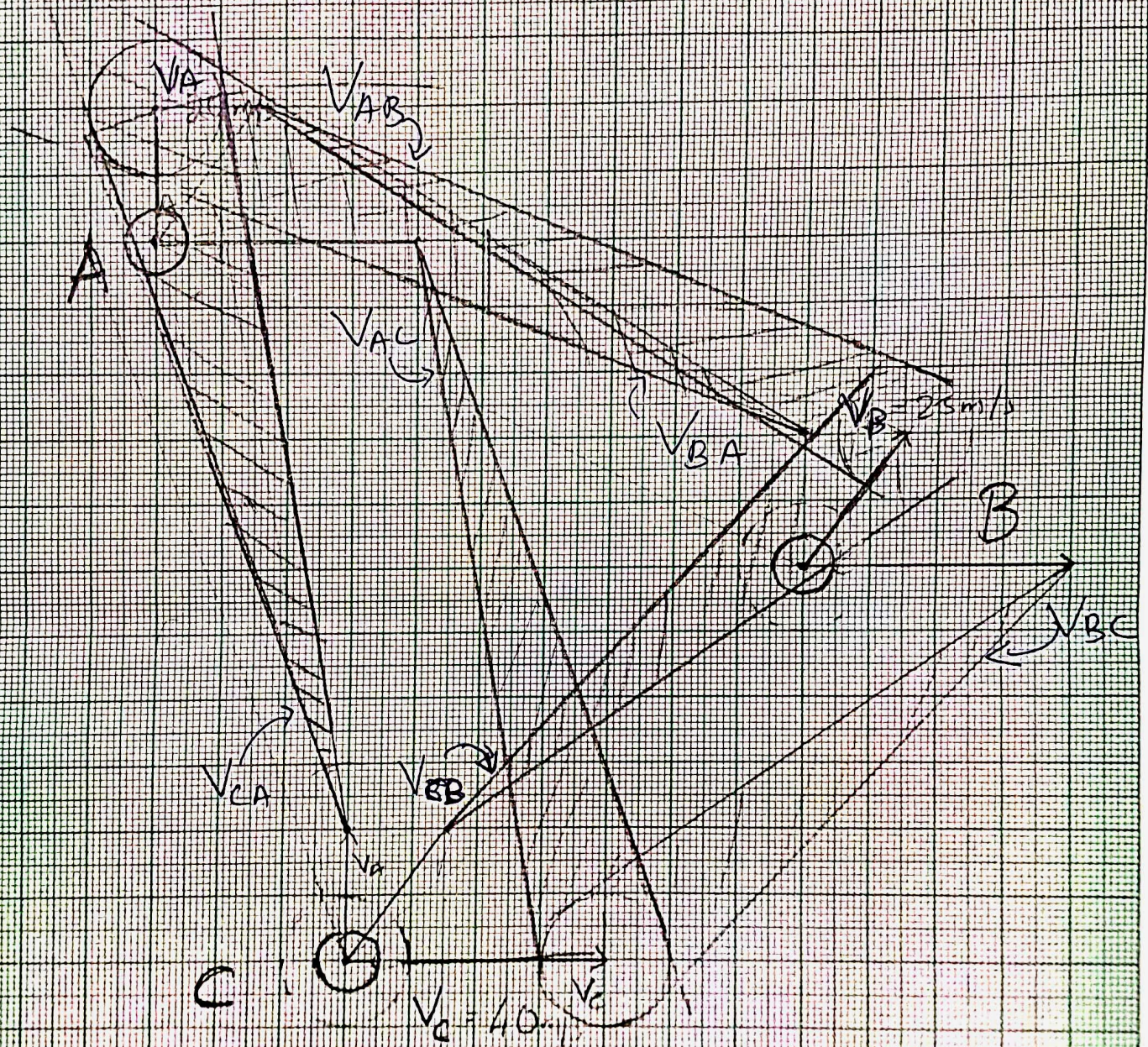
2. Distance b/w A & B = 112 m

Considering that it will take more than 5s

$$\|V_{A,B}\| \geq \frac{112 - 10}{5} = \underline{\underline{20.4 \text{ m/s}}}$$

[Fiorini & Shiller, Pg 765 Eq 5]

$$VO_h = \{ V_A | V_A \in VO, \|V_{A,B}\| \leq \frac{d_m}{T_h} \}$$



QUESTION 2

