

1987Q2 (Date: 1990)

$$\vec{v}_H = 25(\cos 70^\circ)\vec{i} + 25(\sin 70^\circ)\vec{j}$$

$$\vec{v}_H = 17.675\vec{i} + 17.675\vec{j}$$

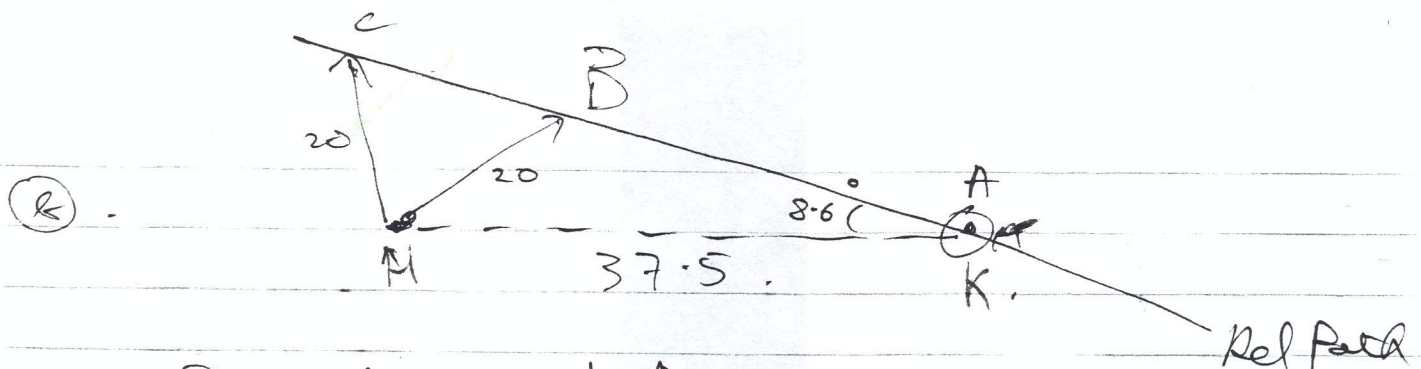
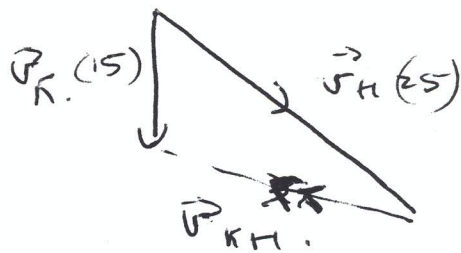
$$\vec{v}_K = -15\vec{j}$$

$$\vec{v}_{KH} = \vec{v}_K - \vec{v}_H = -15\vec{j} - 17.675\vec{i} + 17.675\vec{j}$$

$$= -17.675\vec{i} + 2.675\vec{j}$$

$$v_{KH} = \sqrt{314.5} = 17.88 \text{ km/h.}$$

Dirⁿ w ON where θ is $\tan^{-1}\left(\frac{2.675}{17.675}\right) = 8.6^\circ$.



Begin to signal when ~~it~~ has gone at B

$$|BA| = ? \text{ or } |AC| = ?$$

$$20^2 = |BA|^2 + (37.5)^2 - 2|BA|(37.5)\cos(8.6)$$

$$\Rightarrow |BA| = 17.88 \text{ or } 56.27.$$

$$|BC| = 56.27 - 17.88$$

$$= 38.38.$$

Begin to signal after $\frac{17.88}{17.88} = 1 \text{ hour.}$

Finish after

$$\text{Continue to signal after } \frac{38.38}{17.88} = 2.147 \text{ hrs}$$