$r = R\cos a$

$D = S \times T \quad = 600\times$

Distance $= \frac{\theta}{360} \times 2\pi r$ = small circle

Distance $PQ = \frac{\theta}{360} \times 2\pi R$ – great circle

P small circle

P ——→ Q =

$(60°N, 45°W)$ $(60°N, k°E)$

Speed = Distance x Time

Distance $= \frac{5}{5} \times 600 = 3000$ nm

3000×1.853 km $= 5559$ km

$5559 = \frac{\theta}{360} \times 2 \times 3.142 \times 3185$

$\theta = 99.99 \simeq 100°$

$100 - 45 = 55° = k$

$r = R\cos a$

$r = 6370\cos 60$

$r = 3185$

Therefore

$Q\ (60°N, 55°E)$

Another Approach

$\theta = \frac{\text{Distance in nm}}{60\cos a}$

$\theta = \frac{3000}{60\cos 60} = 10°$

$45 + 10$

$Q = (60°N, 55°E)$

$k = 55°E$

(ii) Local time at Q =

P = 10:45

P ——→ Q
gaining time

longitude difference = 100° = 4min per longitude

~~100x4 = 400 min~~

$100 \times 4 = \frac{400 \text{min}}{60}$ – Time difference

is 6h 40min

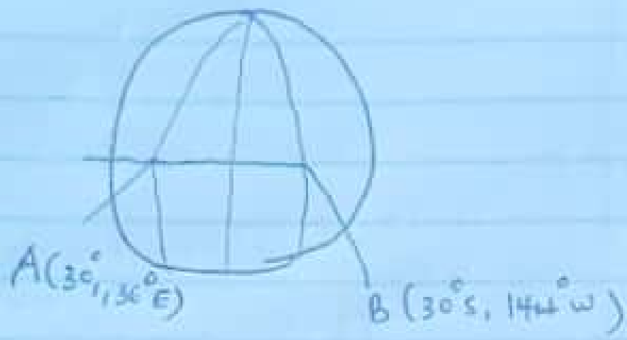
When the plane departure the local time at P was 10:45 while in Q was

10:45
6:40
17:25 = 5:25pm ⇒ As you moves toward east you gain time

So when the plane reached Q you add five hours to the 5:25 pm local time

5:25
5
10:25pm

5b) Shortest distance



360

$36 + 144 = \underline{180}$

$\frac{\theta}{360} \times 2 \times \frac{22}{7} \times R\cos\alpha$

$\frac{180}{360} \times 2 \times \frac{22}{7} \times 6370 \cos 30$

$= \underline{10010 \text{ km}}$

Scanned with CamScanner