

March 2000 Q.1

Dep: $33^{\circ} 56' S$ 2153.59 $018^{\circ} 26' E$.
 A $36^{\circ} 45' S$ 2359.87 $019^{\circ} 00' E$.
 $\frac{2^{\circ} 49'}{206.285}$ $\frac{34 E}{34 E}$

$$\text{True Course} = \frac{D' \text{ long}}{DMP}$$

$$\tan \text{Co} = \frac{34}{206.28} = 9.359596 E.$$

$$D' \text{ lat} = \text{Dist} \times \cos \text{Co}$$

$$\text{Dist} = \frac{D' \text{ lat}}{\cos \text{Co}} = \frac{169}{\cos 9.359596} = \underline{\underline{171.28 \text{ mi}}}$$

A = $36^{\circ} 45' S$ 2359.87 $019^{\circ} 00' E$.
 M $40^{\circ} 00' S$ 2607.64 $055^{\circ} 00' E$.
 $\frac{3^{\circ} 15' S}{195}$ $\frac{247.77}{2160 E}$

$$\text{True Course} = \frac{D' \text{ long}}{DMP} = \frac{2160}{247.77}$$

$$\text{Course} = 83.456297 E.$$

$$\text{Dist} = \frac{D' \text{ lat}}{\cos \text{Co}} = \frac{195}{\cos 83.456297} = \underline{\underline{1711.11}}$$

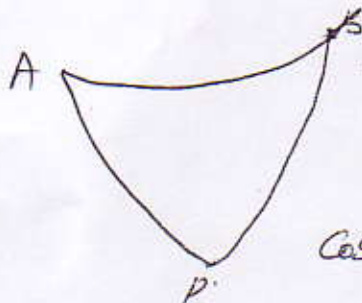
M $40^{\circ} 00' S$ 55 $^{\circ} 00' E$
 S $40^{\circ} 00' S$ 100 $00' E$
 $\frac{45^{\circ} 00'}{2700 E}$

$$= \frac{Dep}{D' \text{ long}} = \cos \text{m' lat}$$

$$Dep = D' \text{ long} \times \cos \text{lat}$$

$$Dep = 2700 \times \cos 40 = \underline{\underline{2068.32}}$$

S $40^{\circ} 00' S$ 100 $^{\circ} 00' E$
 ARRIVAL $34^{\circ} 54' S$ 138 $^{\circ} 25' E$



PA = 50
 PB = 55.1
 P = 38.41667

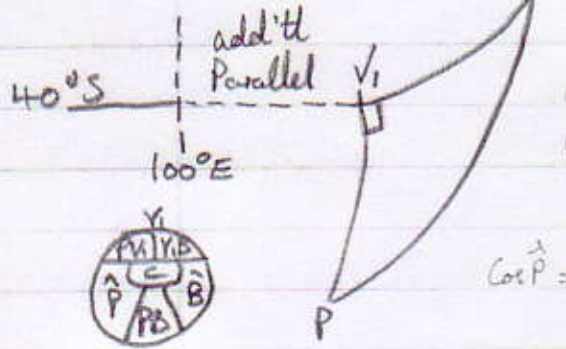
$$\cos AB = \cos P \times \sin PA \times \sin PB + \cos PA \times \cos PB$$

$$\begin{aligned} \cos AB &= \cos 38.41667 \times \sin 50 \times \sin 55.1 + \cos 50 \times \cos 55.1 \\ &= 30.68027 \\ &= \underline{\underline{1840.81 \text{ miles}}} \end{aligned}$$

Total distance = 5791.53 miles + 25
 Final total distance = 5816.53 miles

2/1 SEA: Mar 2000, alternative final leg to stay North of 40°S

Q1



Adelaide 'B' = 34° 54' S 138° 25' E

PV1 = 50°, PB = 55°

$$\cos PB = \cos V1B \therefore V1B = \cos^{-1}(\cos 55^\circ) = 27.11406$$

$$\cos PV1 = \frac{V1B}{PB} = \frac{27.11406}{\cos 50^\circ} = 1626.84$$

$$\cos \hat{P} = \frac{\tan PV1}{\tan PB} = \frac{\tan 50^\circ}{\tan 55^\circ} \therefore \hat{P} = 33.75936 = 33^\circ 45.6' W$$

$$\text{Long } \hat{B}' = 138^\circ 25' 0'' E$$

$$\text{Long } V1 = 104^\circ 39.4' E$$

$$100^\circ E$$

$$D_{\text{long}} = 4^\circ 39.4' E = 279.41$$

$$\text{Dep} = D_{\text{long}} \cos \text{lat} = 279.4 \times \cos 40^\circ = 214.03$$

$$+ 1626.84$$

$$+ 2068.32$$

$$+ 1711.11$$

$$+ 171.28$$

$$\hline 5791.58$$

$$+ 25$$

$$\text{Total Distance} = 5816.58 \text{ miles}$$

Ques 2 March 2000

Using frigate initial pos find 1st Approx
Steps CT using CT + start time find the first
 Approx run time.
 Using run time

Soln

① CT @ $52^{\circ}00' S = 0658$ LMT

LIT $56^{\circ}48' W = 0347$

GMT = $10 45$ 16^m

Start = $20 40$ 15^m

1st Approx run = $14 05$ @ $18K = 253.5'$

Dlat = Dist \times Cos Co
 $= 253.5 \times \text{Cos } 24.8$
 $= 95' S$

Frigate Initial Pos $52^{\circ}00' S$ $056^{\circ}48' W$
 dlat $1^{\circ}35' S$ $6^{\circ}18.6' W$
 $53^{\circ}35' S$ $63^{\circ}16.6' W$

M'lat = $52^{\circ}47.5' S$

Dep = Dist \times Sin Co
 $= 253.5 \times \text{Sin } 24.8$
 $= 235' W$

CT @ $52^{\circ} S = 0658$

CT @ $54^{\circ} S = 0704$

Dlong = Dep / Cos M'lat
 $= \frac{235}{\text{Cos } 52^{\circ}47.5'}$

CT @ $53^{\circ}35' S = 0703$

LIT $063^{\circ}16.6' W = 0413$

GMT = $11:16$ on 16^m

Start = $20:40$ on 15^m

2nd run = $14:36$ @ $18K = 262.8'$

$262.2 \times \text{Cos } 24.8$
 $= 98.4' S$

Initial Pos $52^{\circ}00' S$ $056^{\circ}48' W$
 $1 38.4' S$ $6^{\circ}43.3' W$
 $53^{\circ}38.4' S$ $63^{\circ}31.3' W$

M'lat = $52^{\circ}49.2' S$

$\frac{243.7}{\text{Cos } 52^{\circ}49.1}$
 $= 403.3'$

①① OICF Pos = $50^{\circ}32' S$ $065^{\circ}15' W$
 RV Pos = $53^{\circ}38.4' S$ $063^{\circ}31.3' W$
 $3^{\circ}06.4' S$ $01^{\circ}43.7' E$
 $186.4' S$ $103.7' E$
 M'lat = $52^{\circ}05.2'$

Dep = Dlong \times Cos M'lat
 $= 63.72' E$

Dist = Dlat / Cos Co = $197'$ Ans Spd = $\frac{197}{14.6}$
 Steer = $161.1^{\circ} (T)$ for $197'$ = $13.49Kt$

Tan Co = dep / dlat

Co = $518.87^{\circ} E$ Ans