

Chief Mate - SQA - NAV - November 2004.

(Sol)

Q1. Departure Lyttleton NZ $43^{\circ} 36' S$ PA $46^{\circ} 4'$ $172^{\circ} 49' E$
Landfall Panama $08^{\circ} 00' N$ PB 98° $079^{\circ} 00' W$ Dlong $108^{\circ} 11' E$

(15) a) $\cos AB = \cos P \sin PA \sin PB + \cos PA \cos PB$
 $AB = \cos^{-1}(\cos 108^{\circ} 11' \sin 46^{\circ} 24' \sin 98^{\circ} + \cos 46^{\circ} 24' \cos 98^{\circ})$
 $= 108^{\circ} 64848 = \underline{6518.9}$ a) **

(15) b) $\cos PAB = (\cos PB - (\cos PA \cos AB)) \div (\sin PA \sin AB)$
 $PAB = \cos^{-1}(\cos 98 - (\cos 46.4 \cos 108.64848)) \div (\sin 46.4 \sin 108.64848)$
 $= 583.19181 E = 583.2 E = \underline{096.8 T}$ b) **

(20) c) $\sin Pv = \sin PA \times \sin A \therefore Pv = \sin^{-1}(\sin 46.4 \sin 83.19181) = 45.97737$
 $\therefore \text{Lat } V = 44.02263 = \underline{44^{\circ} 01.4 S}$ c) **
 $\tan P = 1/\cos PA \tan A \therefore P = \tan^{-1}(1/(\cos 46.4 \tan 83.19181)) = 9.82176^{\circ} c)$
 $172^{\circ} 49' E + 9^{\circ} 49.3' E = 182^{\circ} 38.3' E = \underline{177^{\circ} 21.7 W}$ c) **

(5) d) Long @ $Eq^b = 177^{\circ} 21.7 W - 90^{\circ} = \underline{087^{\circ} 21.7 W}$ d) **

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(JL)

Q2.

Cruise Ship (CS) @ 2125 GMT / 12th 29°36'N 064°18'W.

R/V @ Sunrise 13th May. @ 30°N 0508 LMT

$0.4 \times 17 = 0.7$ 20°N 0525 LMT.

10 29°36'N 0509 LMT

LIT. 64°18'W 4 17

1st Approx Sunrise 13th 09 26 GMT.

Start 12th 21 25 GMT

1st Approx Run 12 h 01 m @ 22K = 264.4

1st Approx

Dist = Dist x Cos ϕ

$= 264.4 \cos 262^\circ$

$= 36.797375$

Dep = Dist x Sin ϕ

$= 264.4 \sin 262^\circ$

$= 261.82688 \text{ W}$

2nd Approx

Dist = 272.1 Cos 262°

$= 37.869 \text{ S}$

Dep = 272.1 Sin 262°

$= 269.45194 \text{ W}$

Start Pos'n CS 29°36'N 064°18'W

1st Dist 36.8 S 5° 00.2 W

1st Approx Lat 28°59.2' N Long 069°18.2' W

M Lat 29°17.4'

Dlg = Dep ÷ Cos M Lat = $261.82688 \div \cos 29^\circ 17.4' = 300.2 \text{ W}$

LMT @ 29°N = 0510 LMT

LIT. 69°18.2' W = 4 37

2nd Approx Sunrise = 09 47 GMT 13th May a) ** (15)

Start = 21 25 GMT 12th

2nd Approx Run = 12 22 @ 22K = 272.1

c) R/V Calc's.

Dep = Dlg Cos M Lat

$= 72.0 \cos 30^\circ 07'$

$= 63.15580 \text{ W}$

Tan ϕ = Dep / Dist

$\phi = \tan^{-1}(63.15580 / 137.9)$

$= 524.57367 \text{ W}$

Dist = Dist / Cos ϕ

$= 137.9 / \cos 24.57367$

$= 151.63389$

SP = 151.6 / 12.36667

$= 12.26 \text{ K.}$

Start Pos'n CS 29°36'N 064°18'W

2nd Dist 37.9 S 5° 08.9 W

R/V Pos'n 28°58.1'N 069°27.0'W b) ** (20)

M Lat 29°17' ∴ Dlg = $269.45194 / \cos 29^\circ 17' = 308.98 \text{ W}$

c)

RV 28°58.1'N 069°27.0'W

CV Start 31°16.0'N 068°14.0'W

Dist 2°17.9 S 1°12.0' W = 72.0 W

137.9 S M. Lat 30°07'

CV to Steer 204.6 T @ 12.26 K. c) ** (15)

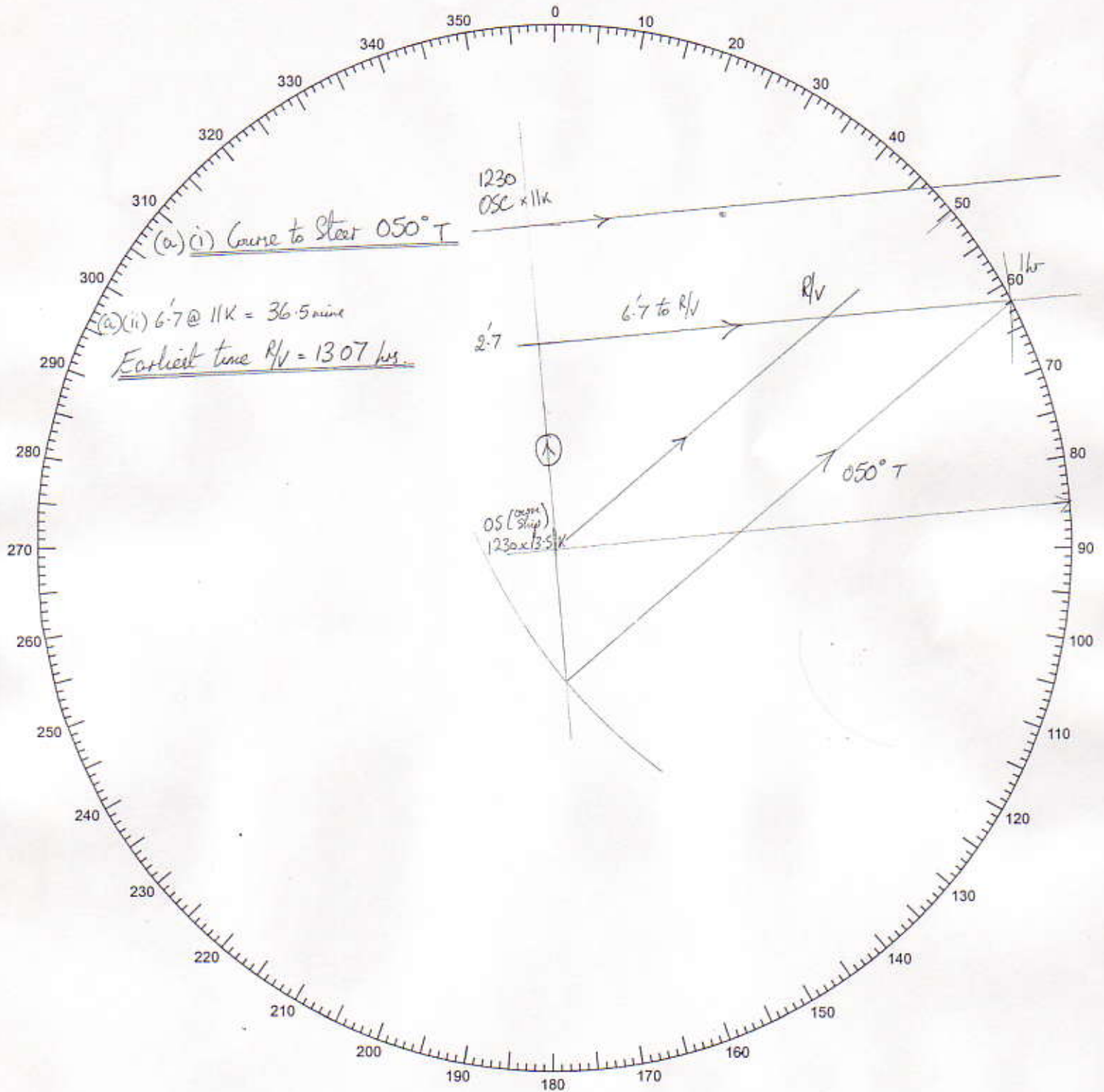
(This Worksheet must be returned with your answer book)

Question 3

(a) (i) & (ii)

$20' Va = 7.5 Sa$ for 2.5 man left
 $3' Va = 2.7 Sa$

RADAR PLOTTING SHEET



(This is not a metric scale)

Signature of Candidate _____

Examination Centre _____