

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) **
 $\tan P = 1 / \cos PA \tan A \therefore P = \tan^{-1}(1 / (\cos 46.4 \tan 83.19181)) = 9.82176 E$
 $172^{\circ} 49' E + 9^{\circ} 49.3' E = 182^{\circ} 38.3' E = \underline{177^{\circ} 21.7 W}$ c) **

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

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(PL)

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

Dist = Dist x Cos Co

= 264.4 Cos 262°

= 36.79737 S

Dep = Dist x Sin Co

= 264.4 Sin 262°

= 261.82688 W

2nd Approx

Dist = 272.1 Cos 262°

= 37.869 S

Dep = 272.1 Sin 262°

= 269.45194 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 ÷ Cos 29° 17.4 = 300.2 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° 07'

= 63.15580 W

Tan Co = Dep / Dist

Co = Tan⁻¹ (63.15580 / 137.9)

= 524.57367 W

Dist = Dist / Cos Co

= 137.9 / Cos 24.57367

= 151.63389

SP = 151.6 / 12.36667

= 12.26 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° 17' = 308.98 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)

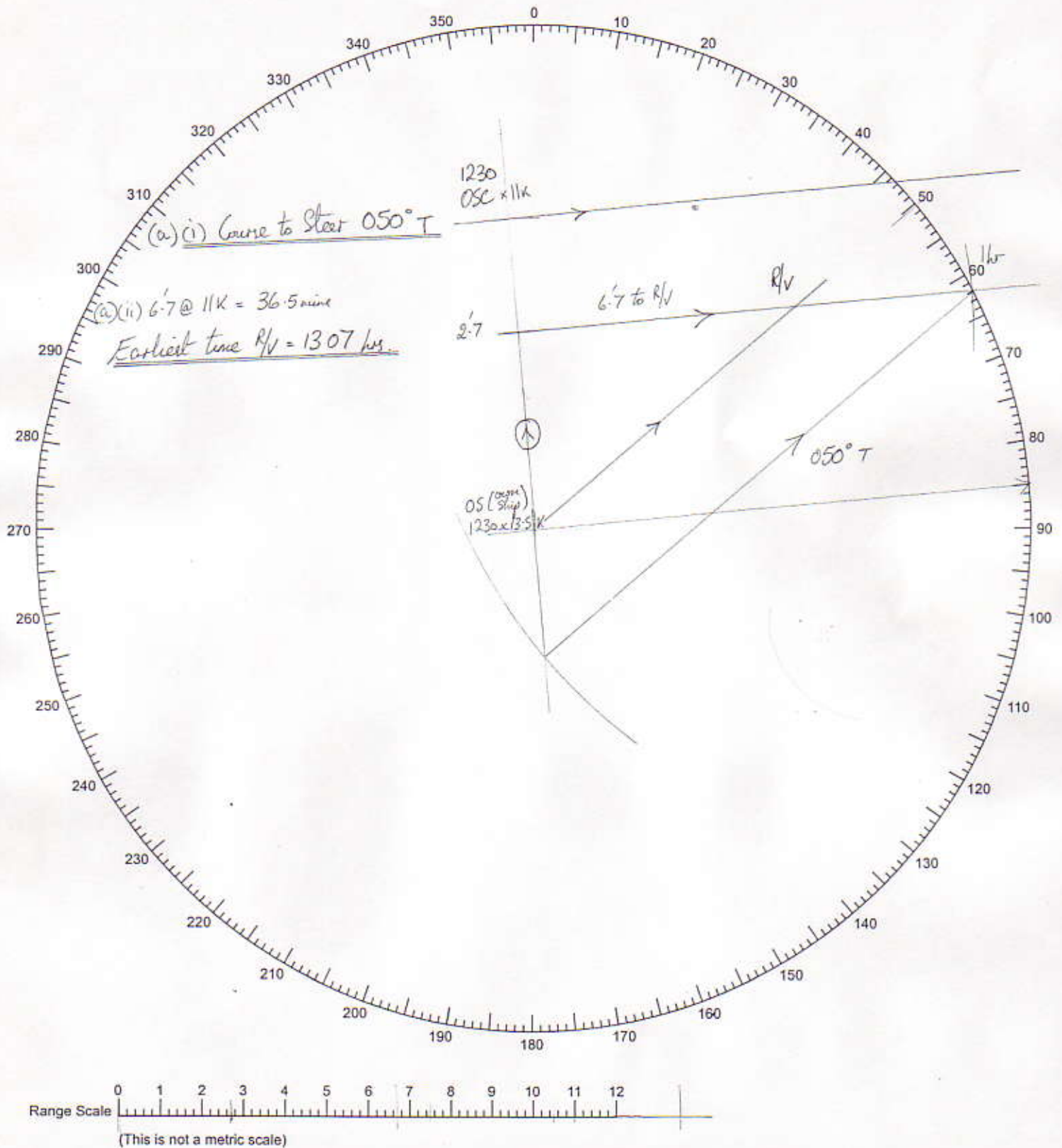
(This Worksheet must be returned with your answer book)

Question 3

(a) (i) & (ii)

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

RADAR PLOTTING SHEET



Signature of Candidate _____

Examination Centre _____