M24 NAVIGATION EXERCISES AUS 252

NAME:

Use chart Aus 252 extract. Use the deviation card at end of this paper. Answers

EXERCISE NO. 1　　　　CHART INFORMATION

Select Chart Aus252 and answer the following.

1　Find the extent of latitude and longitude

2　Give the Chart number and title

3　Find the last small correction

4　Give date of publication

5　Give measurement of soundings (metric or imperial)

6　See how many symbols you can identify using Chart Aus252.

7　What tidal information is given?

8　What warnings are given?

9　What is the latest magnetic variation?

10　What is the scale and projection?

EXERCISE NO.2   CHART SYMBOLS

1 Draw Chart symbols for the following:-

(a) Steep Coastline   (b)   Disused submarine pipeline

(c) A rock which dries to 1.6 metres   (d)   An easterly current of 2 knots

(e) Sand dunes   (f)   Triangulation point

(g) South cardinal buoy   (h)   Dangerous wreck

(i)   Direction of buoyage   (j)   A flood tide of 1.5 knots

(k)   Eddies, tide rips and overfalls   (l)   A submarine power cable

(m)   A rock awash at chart datum   (n)   A isolated danger beacon

2 Draw chart symbols for the following

(a) Shore breakers   (b) Designated anchorage B

(c) Prohibited anchorage   (d) Cliffy coast

(e) An oil pipeline   (f) An airfield

(g) A quarantine anchorage   (h) Starboard special purpose buoy

(i) Hillocks transponder beacon

(j) X band radar (racon), morse R

(k) Underwater rock with less than 2 metres of water over it.

(l) Reef which covers and uncovers

3 Give meanings of the following

(a) ED

(b) MHWS

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(c) Wk

(d) Q(3)10s20m6M

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(e) (Oc)

(f) PA

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(g) WRG

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(h) Dr

(i) IQ

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(j) Oc(2)6s10M

(k) Iso.Bu.10s

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(l) Rep

(m) LAT

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_____

(n) Pk

(o) fS

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(p) soM

(q) bkSh   (r) Wd

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4 What does AUS 252 in the upper right margin of a chart signify?

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5   How can you find out whether a chart has been corrected up to date?

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6 How might soundings from an older survey be recognised on a chart?

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7   What are the problems associated with using a gently sloping coastline when observing ranges and bearings?

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8   Define Latitude and Longitude

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9   Name 2 ways of giving your position on the earth's surface.

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10   How are bearings and courses depicted on a Mercator Chart?

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11   How do you measure distance on a Mercator Chart?

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12   What are contained in the Admiralty Notices to Mariners?

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13 Describe what is usually included under the Title or Legend of a Chart?

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14 What should you check when using a coastal chart?

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15 What should you take into account when laying off courses?

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16 How should you keep a ship's log and what entries for navigation should be entered?

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17 When navigating between Islands, what should you watch out for?

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EXERCISE NO.3   COMPASS ERROR

Use the deviation card provided at the end of this Section.

1 From the Compass Rose you read:

Mag. Var. 6°50E (1972), Increasing about 3.5' annually.

What is the variation for 1992?

T	V	M	D	C	Error

2 True Course 280°, Variation 11°E.

What is the Compass Course?

T	V	M	D	C	Error

3 Compass Course is 150°, Variation 9°E.

What is the True Course?

T	V	M	D	C	Error

4 Steering 030°(C), Coppersmith Rock bears 357°(C)

Variation 9°E.

What is the True Bearing of Coppersmith Rock?

T	V	M	D	C	Error

5 Steering 260°(C), Breaksea Light Vessel bears 032° Relative.
What is the True Bearing of Breaksea Light Vessel? Variation 10°E.

T	V	M	D	C	Error

6 On the chart you read: "Leading Lights 317°00'"
You enter port with these leads in line and right ahead, steering 311°(C)

Variation is 8°E.,   What is the Deviation?

T	V	M	D	C	Error

7 From the compass rose you read:

Mag.Var. 7°45'E (1972), Increasing about 4' annually.
What variation would you use today?

T	V	M	D	C	Error

8 True course is 172°, variation 12°W.
What is the compass course?

T	V	M	D	C	Error

9 Compass course is 265°, variation 9°E.
What is the true course?

T	V	M	D	C	Error

10 When steering 070°(C), Round Hill Head is bearing 270°(C).

Variation is 11°E.
What is the true bearing of Round Hill Head?

T	V	M	D	C	Error

11 You are steering 290°(C) with Lady Elliot abeam to port.
Variation is 11°E.
What is the true bearing of Lady Elliot?

T	V	M	D	C	Error

12 On the chart you read "Lights in Line 074°".
By your compass the bearing of the lights when they are in transit is 067°. Variation is 12°E. What is the deviation?

T	V	M	D	C	Error

EXERCISE NO.4   POSITION FINDING

Unless otherwise stated all positions are to be given in Lat. and Long.

1   Steering 130°(C) Hook Pk (1478) hears 248°(C)   Right hand end of Border Is. bears 199°(C)   Petrel Is. bears 150°(C)

What is your position?

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2   By radar range the nearest points of Mansell Is. and Jesuit Point are both 4.8 miles. Nicholson Is. is 7.0 miles.

What is your position?

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3   By radar the relative bearing of Surprise rock is 017° and the range 3.2 miles. Your course is 265°(C).

What is your position?

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4   The bearing of Esk Is. if 247°(G). Gyro error is 2°(H). The corrected sounding is 20 fathoms.

What is your position?

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5 You are heading 335°(C) at an estimated speed of 10.0 knots

At 1730 hrs Double Cone Is. Peak bears 285°(C).

At 1748 hrs it bears 243°(C).

What is your position at 1748 hours?

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_____

6 You are steering 325°(C) at 6.0 knots.

At 0206 Dent Is. Ltd bears 030°(R)

At 0218 it bears 060°(R).

What is your position at 0218 (bearing and distance from Dent Is. Lt)?

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_____

7 Your compass is damaged. At 0600 Petrel Is. is in transit with Whitsunday Peak when the radar range of Petrel Is. is 3.1 miles.

What is your 0600 position?

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8 The end of land at Jesuit Point is in transit with Pentecost Is. (949) bearing 284°(C). At the same time Shaw Peak 1339 bears 229°(C) and Mansell Is. (630) bears 189°(C).

What is your position?

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9 What are the causes of a "cocked hat" and how may they be overcome?

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10 Give your position in Lat. and Long, if the bearing of Whitsunday Peak is 140°C and the sextant angle 2° 19 no index error.

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11 What should be looked for in selecting objects for observation in Bearings?

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EXERCISE NO.5   SET, RATE & DRIFT

Requires full chart AUS252 available from your chart agent.

1   You depart the Elliott River entrance at 0900, steering 070°(T) at 6.0 knots. If the tide is flooding as charted, what is your estimated position at 1200?

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2   From a position 2.0 mls South of Lady Elliott I. light at 0600, you set course direct to South Head. Your speed is 11.0 knots.

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At 0900 South Head lighthouse bears 172°(T), range 10.2 mls.

What set and drift have you experienced?

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3 At 0300 you are 2.0 mls East of Bustard Head light. You wish to set course directly for Lady Musgrave I. Your speed is 9 knots.

What course should you steer to counteract a tide setting 130° at 2.5 knots?

When will you arrive 1.0 mile off Lady Musgrave I.?

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4 You are steering 150°(C) at 8.0 knots

At 1000	Shaw Peak ∆ 1339	bears 265°(C)
	Silversmith I. ∆	bears 219°(C)
	Linne I. ∆ 932	bears 185°(C)

At 1100	Linne I. ∆ 932 bears 237°(C)	
	Skiddaw Pd. ∆	129 bears 177°(C)
	Cockermouth I. ∆	670 bears 138°(C)

What is the set and drift?

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5 At 0600 Red Cliff I. (130) bears 260°(C) Radar range 1.3 mls.

Course 043°(C), Speed 4.5 knots

At 0800 Allonby I. (198) bears 076°(C) Radar range 3.8 mls.

What is the set and drift?

What is the rate of the tidal stream?

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6 At 0230 a fix is obtained 0.5 mls true south of Coppersmith Rock.

You steer 285°(C) at 5.0 knots until 0400.

The tide has set 155°(T) at 1.2 knots throughout.

What is your 0400 E.P.?

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7 At 0418 the north end of N. Repulse I. is in transit with Cape Conway, whilst S. Repulse ∆ 217 bears 114°(G).

The Gyro has an error of 2°(L).

You steer 143°(T) at 1.0 knot throughout.

What is your 0600 E.P.?

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8 Your 1300 position is 1.0 mile true east of Devereaux Rock.

You wish to pass Coppersmith Rock 1.5 mls off your port side.

Your speed is 7.0 knots. The tide is expected to set 075°(T) at 1.8 knots throughout.

What is the compass course to steer to counteract the tide?

What is your E.T.A. at a position with Coppersmith Rock on your port beam?

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9   You are at anchor at 0700 with Croaker Rock in transit with Stewart Peninsular Δ 417 bearing 282°(C). At the same time Rabbit I. (365) bears 197°(C).

If your ship's speed will be 6.0 knots, what is the compass course to steer to reach a position 3.0 mls true north of Gould I. when the tide is setting 125°(T) at 2.0 knots?

How long will the trip take?

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10   At 1230 Cockermouth I. Δ 670 bears 343°(C)

Devereaux Rock bears 286°(C)

You are steering 240°(C) at 6.7 knots.

At 1348 Singapore Rock bears 094°(C), range 3.0 mls

What is the set and drift?

At 1348 you decide to increase speed to 8.0 knots and head for a position 1.0 mile true west of Allonby I. Δ

What is the compass course to steer to counteract the current you discovered above?

If a south-westerly wind is expected to cause 5 leeway, what course would you steer by compass?

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EXERCISE NO.6   TIDES

1. What are the times and heights of high and low waters at Fremantle on

November 22nd 1996?

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2. What are the times and heights of afternoon high and low water at Darwin on

June 3rd 1996?

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3. What are the times and heights of high waters at Gladstone on

September 12th 1996?

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4. What is the earliest time and height of high water at Newcastle on

April 3rd 1996?

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Secondary Ports. (requires a secondary ports form)

5 You require to find the times and heights of high and low water at Heron Island for the 10th July 1966.

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6 You require to find the times and heights of high and low water at Launceston for 21st January 1966.

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7. You require to find the times and heights of high and low water at Adele Island for the morning of the 10th March 1966

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8 You require an under keel clearance of 0.5 metre and your draught is 2.25 metres. What height of tide is required to safely clear a charted sand bar which dries 1.2 metres.

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9 You require an underwater clearance of 0.7 metres. The tidal height is 3.2 metres. What is the maximum draft you may have to clear a bar which dries to 1.1 metres.

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10 The tidal height is 4.8 metres and your draught is 2.1 metres. If you require a minimum under water clearance of 0.8 metre, what is the maximum drying height you can safely steam across?

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EXERCISE NO.7   WHEELHOUSE EQUIPMENT

1 Why are Radar ranges preferred to Radar bearings?

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2 How would you recognise a Racon on a Radar Screen?

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3 What effect can the tide have on different types of coast line in relation to taking ranges from the RADAR?

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4 What should be taken into account when comparing chart soundings with those shown on the echo sounder?

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5 Is a D.O.P. value 8, a good or bad satellite arrangement?

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6 Describe the following errors associated with the G.P.S.

a. Dilution of Precision

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b. Environmental Errors

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c. Spheroidal Errors

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7 Where can corrections to Satellite-Derived Positions be found?

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8 Explain 5 capabilities plotters can be used for in navigation.

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9 What errors should you be aware of when using a plotter?

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10 What is Waypoint Navigation?

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11 When working with electronic aids to navigation, it is suggested a written log book be kept.

Design a log book sheet to cover the aids in a present / or last vessel.

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DEVIATION CARD 3 NAVIGATION			
Ship's Head by Compass	Deviation	Ship's Head by Compass	Deviation
000^0	$3\frac{1}{2}^0$E	180^0	$2\frac{1}{2}^0$W
010^0	4^0E	190^0	4^0W
020^0	$4\frac{1}{2}^0$E	200^0	5^0W
030^0	5^0E	210^0	$5\frac{1}{2}^0$W
040^0	5^0E	220^0	$6\frac{1}{2}^0$W
050^0	5^0E	230^0	$6\frac{1}{2}^0$W
060^0	$5\frac{1}{2}^0$E	240^0	7^0W
070^0	$5\frac{1}{2}^0$E	250^0	$6\frac{1}{2}^0$W
080^0	5^0E	260^0	$6\frac{1}{2}^0$W
090^0	5^0E	270^0	$5\frac{1}{2}^0$W
100^0	$4\frac{1}{2}^0$E	280^0	$4\frac{1}{2}^0$W
110^0	4^0E	290^0	$3\frac{1}{2}^0$W
120^0	$3\frac{1}{2}^0$E	300^0	$2\frac{1}{2}^0$W
130^0	3^0E	310^0	$1\frac{1}{2}^0$W
140^0	2^0E	320^0	$\frac{1}{2}^0$W
150^0	1^0E	330^0	$\frac{1}{2}^0$E
160^0	$\frac{1}{2}^0$W	340^0	$1\frac{1}{2}^0$E
170^0	$1\frac{1}{2}^0$W	350^0	$2\frac{1}{2}^0$E
180^0	$2\frac{1}{2}^0$W	000^0	$3\frac{1}{2}^0$E