

M5 NAVIGATION EXERCISES

NAME:

Use chart AUS 811

EXERCISE NO. 1 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) Clifly 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 Explain the following

(a) Sh

(b) MHWS

(c) Wk

(d) Q(3)10s20m6M

(e) (Oc)

(f) PA

(g) WRG

(h) Dr

(i) IQ

(j) Oc(2)6s10M

(k) Iso.Bu.10s

(l) Rep

(m) LAT

(n) Pk

(o) fS

(p) soM

(q) bkSh

(r) Wd

4 What does AUS 811 in the upper right box marked on the chart signify?

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

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

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

8 Define Latitude and Longitude

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

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

11 How do you measure distance on a Mercator Chart?

12 What are contained in the Admiralty Notices to Mariners?

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

14 What should you check when using a coastal chart?

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

17 When navigating close inshore, what should you watch out for?

EXERCISE NO. 2**COMPASS ERROR**

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

1 From a Compass Rose you read:

Mag. Var. $12^{\circ}35'E$ (1994), Increasing about 1' annually.

What is the variation for 2008?

T	V	M	D	C	Error

2 True Course 280° , Variation $11^{\circ}E$.

What is the Compass Course?

T	V	M	D	C	Error

3 Compass Course is 150° , Variation $12^{\circ}E$.

What is the True Course?

T	V	M	D	C	Error

4 Steering $030^{\circ}(C)$, Tacking Point bears $278^{\circ}(C)$

Variation $12^{\circ}W$. What is the True Bearing of Box Head?

T	V	M	D	C	Error

5 Steering 260°(C), North Head bears 032° Relative.

What is the True Bearing of North Head? Variation 10°E.

T	V	M	D	C	Error

6 On the chart you read: "Leading Lights 294°00"

You enter port with these leads in line and right ahead, steering 311°(C)

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

T	V	M	D	C	Error

7 From a 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 $070^\circ(\text{C})$, Crowdy Light is bearing $220^\circ(\text{C})$.

Variation is 11°E .

What is the true bearing of Crowdy Light?

T	V	M	D	C	Error

11 You are steering $290^\circ(\text{C})$ with Crowdy Light abeam to port.

Variation is 11°E .

What is the true bearing Crowdy Light?

T	V	M	D	C	Error

12 On a 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. 3

TIDE

TIDAL PREDICTIONS

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

November 22nd 2008?

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

June 3rd 2008?

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

September 12th 2008?

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

April 3rd 2008?

Secondary Ports. (Use the secondary ports form)

5 You require to find the times and heights of high and low water at Brisbane Island for the 10th July 2008.

6 You require to find the times and heights of high and low water at Hobart for 21st January 2008.

7. You require to find the times and heights of high and low water at Adele Island for the morning of the 10th March 2008

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.

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.

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?

EXERCISE NO. 4

ELECTRONIC AIDS

1 Why are Radar ranges preferred to Radar bearings?

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

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

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

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

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

a. Dilution of Precision

b. Environmental Errors

c. Spheroidal Errors

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

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

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

11 What is Waypoint Navigation?

12 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.

EXERCISE NO. 4

PASSAGE PLANNING _____ CHART AUS197

Using the [passage planner](#) provided, compile the necessary pilotage information complete the chart work to safely navigate from Crowdy Harbour to Port Macquarie on 04/03/08. This plan may be used with [Motorboat Simulator](#) and the Australian Scenery Package, Sydney Coastal.

YOUR VESSEL

Choose one of the vessels described below for your plan:

'Hercules'

Single 8/71 GM 300 Kw's each
Cruise speed 9 knots
Max. Tow speed 8 knots
Fuel Consumption 50 ltrs /hr at Cruise
Max. speed 10 knots
Draft 2.1 meters
Lowrance GPS, Furuno radar, steering compass, hand bearing compass, sextant
MF/HF, VHF and 27Mhz radios.

'Rescue Sim'

Twin Yanmars producing 250 Kw's each
Cruise speed 20 knots
Top speed 26 knots
Fuel Consumption 19 ltrs /hr at Cruise
Draft 1.0 meters
Lowrance GPS, Furuno radar, steering compass, hand bearing compass, sextant
MF/HF, VHF and 27Mhz radios.

PILOTAGE INFORMATION

Conditions on 04/03/08 are:

[Tidal](#) predictions

Current 165° 1.5 kts

Weather SE 15 -18kts, 1 mtr seas, 1 mtr S swell, fair, barometer steady.

[Deviation card](#)

CONTINGENCY PLANNING

Include contingencies for:

Identifying coastal features of use to confirm the accuracy of your deviation card.

A safe distance off charted dangers by [VSA](#).

A clearance bearing.

Preparation for a doubling of the angle off the bow.

A running fix from an isolated coastal feature.

A safe haven in the case of deteriorating weather conditions.

<u>DEVIATION CARD 2 COASTAL NAVIGATION</u>		
Magnetic Heading	Deviation	Ships Head By Compass
356°	4°W	000°
015°	5°W	020°
034°	6°W	040°
056°	4°W	060°
078°	2°W	080°
099°	1°W	100°
121°	1°E	120°
143°	3°E	140°
164°	4°E	160°
186°	6°E	180°
208°	8°E	200°
230°	10°E	220°
248°	8°E	240°
266°	6°E	260°
283°	3°E	280°
301°	1°E	300°
319°	1°W	320°
338°	2°W	340°
356°	4°W	360°
Study example only - Not for navigation		