Marine Science
For Australian Students

National Powerboating Workbook

Worksheets

Published by

Wet Paper Publishers and Consultants
PO Box 540
COOLANGATTA 4225
www.wetpaper.com.au
info@wetpaper.com.au

ISBN
978-1-86283-122-3

Disclaimer

Although all care has been taken to provide information, safety instructions, offers of training and advice, Wet Paper or any of its sponsors, employees, advisors or consultants accept no responsibility for any accident that may occur as a result of students performing any of these activities. If students, teachers or instructors are unsure of any information or method, they are advised to contact their own State Government Marine Safety or Education Department.

Contents

WORKSHEET 1 AT THE BOAT RAMP

Launching

Q1. Explain the following terms:

Hazard

Risk

Safety precautions *(Control measures)*

Q2. Identify any three hazards that could be found on the boat ramp in the photograph above.

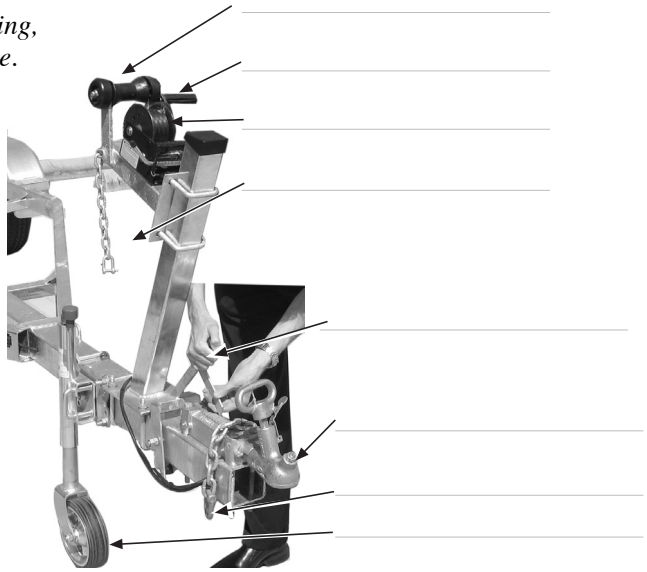
Q3. Describe any five safety control measures you could use to reduce risks while using the boat ramp shown above.

Q4 Justify four winch safety tips.

Q5. Explain how to protect an outboard motor while towing on a trailer behind a car.

Q6. Identify the following safety features on the trailer using the list of terms below.

Roller, manual winch, winch strap, safety chain, coupling, brake handle, jockey wheel, safety chain to towing vehicle.



Q7. Suggest a care and maintenance procedure for the following parts of a trailer.

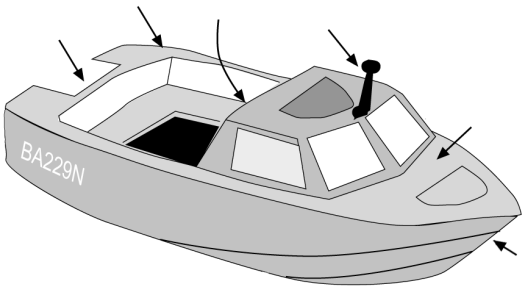
Winch

Lights

Bearings

Jockey wheel

WORKSHEET 2 BOAT PARTS AND HULL COMPLIANCE



Q1. Label the following parts of a boat on the diagram opposite.

Bow, stern, port side, all-round light, stem, transom, deck, gunwale, cockpit. Mark in the port side and the starboard side to show you know the difference.

Q2. Explain the terms freeboard and gunnel.

Q3. Explain why the motor power and weight on as vessel should never exceed the manufacturers design.

Q4. Account for the need for sufficient freeboard on a vessel.

Q5. Explain how engine power contributes to the difference between planing and displacement hulls.

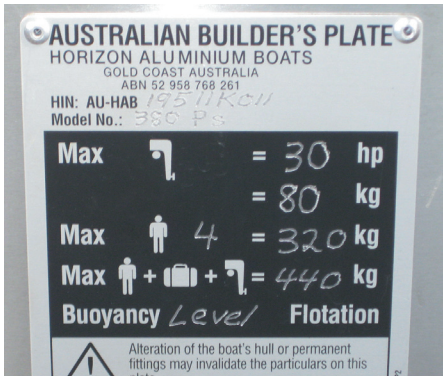
Q6. Compare the terms basic and level flotation as they apply to boat safety.

Q7. Identify which of the boats on page 7 you would take over a bar in a 1 metre sea.

Q8. Interpret the builders plate shown in the figure opposite in terms of a fishing party that had an esky of ice and drinks for a group who wanted to go fishing for the day in sheltered waters.

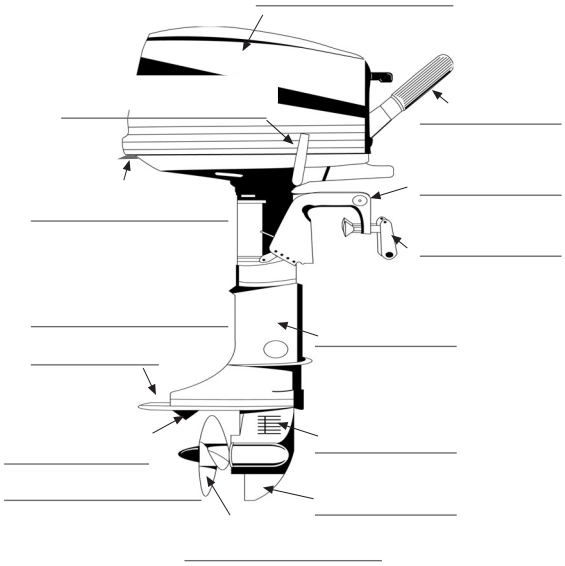
a. Identify the max hp motor that can be attached to the transom.

b. Determine the number of adults and children the boat can carry.



Q9. Account for changes in loading for a boat with a capacity label as shown opposite.

WORKSHEET 3 ENGINES AND FUEL



Q1. Complete the the diagram opposite marking in the following parts of an outboard motor.

Cowling, throttle, tiller, clamp brackets, clamp handles, shift lever, outboard leg, anti-ventillation plate, water intake, skeg, propeller, sacrificial anode, cowling clamp.

Q2. Describe one advantage and one disadvantage of the following engine types:

Inboard: *Advantage:*

Disadvantage:

Outboard: *Advantage:*

Disadvantage:

Stern drive *Advantage:*

Disadvantage:

Bob Moffatt

Q3. Indicate where each of the following are found on the diagram of the Johnson outboard opposite.

Starter cord, choke, connection to motor, fuel line, fuel cap relief valve, primer bulb, fuel tank, throttle, tiller

Q4. Explain what a "tell tail" does.

Q5. Describe why marine batteries are used to start engines.

Q6. Justify two maintenance requirements for modern engines.

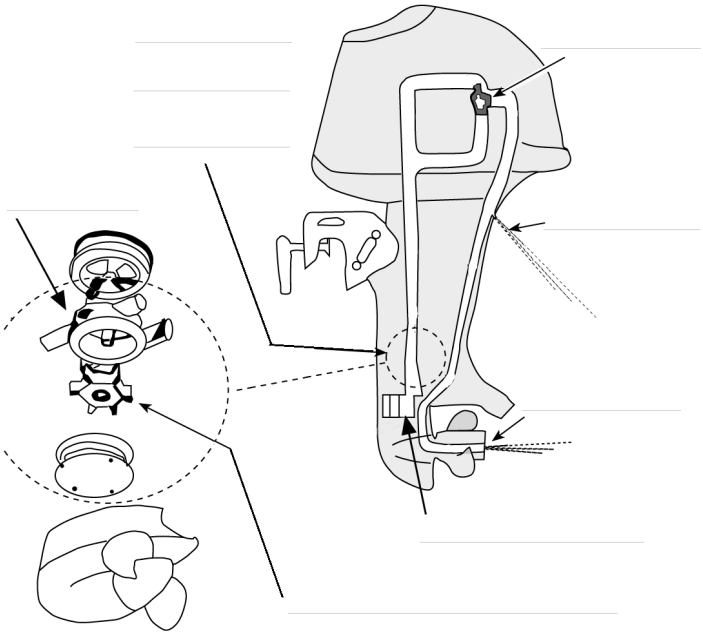
Q7. Describe the function of the safety lanyard.

Q8. Indicate where the following parts of the cooling system can be found on the diagram opposite.

Pump, impeller, water intake, water outlet, water pump assembly, thermostat, tell tail.

Draw arrows in the illustration opposite to show the direction in which water travels.

Describe the function of the impeller and explain how it can become fouled.



WORKSHEET 4 BERTHING AND STEERING

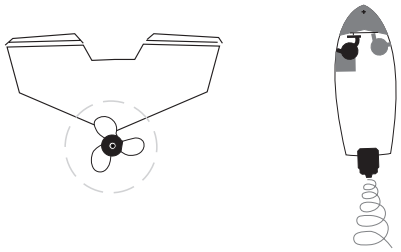
Q1. Describe the function of the spring line in docking.

Q2. Justify the use of fenders on a boat.

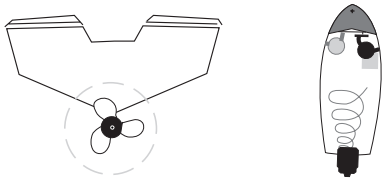
Q3. Suggest what could happen if your boat was not in good condition.

Q4. Indicate by means of arrows, the effect of a right handed prop in the diagram below.

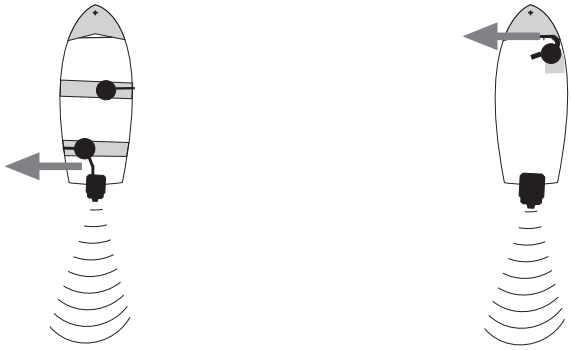
Ahead



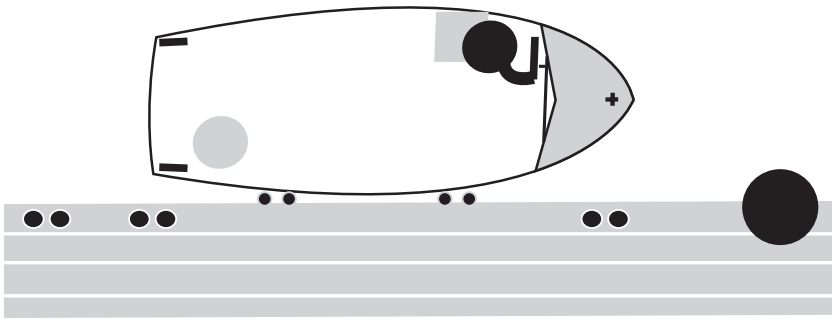
Astern



Q5. Indicate by means of arrows, which way the bow will swing if the tiller or steering wheel is pulled or turned to the left in the diagrams opposite. Account for the difference.



Q6. Complete the diagram below to show the bow line, stern line, bow spring and stern spring lines.



Q7. Describe why nylon is used as a mooring line.

Q8. Describe how to tie off to a cleat (see page 38)

WORKSHEET 5 PRE-TRIP CHECKLIST

Indicate by a tick in the list opposite which items apply to your boat for a days boating in sheltered waters.

Describe how these items could change if you were camping overnight on a island with no mobile phone coverage.

Boat

[ ] Bungs - Attached
[ ] Cables and linkages - Serviceable
[ ] Canopies and fittings - Serviceable
[ ] Fuel/gas - Leak sniff test completed
[ ] Hull - Integrity secure
[ ] Motor well - Integrity secure
[ ] Ropes and lines - Serviceable

Stability

[ ] Bilges dry - Checked
[ ] Capacity label - Checked
[ ] Self draining holes – Clear
[ ] Stowage for all items – Checked

Motor

[ ] Dead man's switch - Serviceable
[ ] Hydraulics and linkages - Serviceable
[ ] Oil levels and coolants - Checked
[ ] Prop and shaft condition - Serviceable
[ ] Raw water intake filters - Serviceable
[ ] Service record – Completed for GSO
[ ] Starts and tell tail - Operational
[ ] Steering cables - Serviceable
[ ] Motor travel support bar - Attached
[ ] Trim and tilt – Serviceable

Fuel

[ ] Fresh, not last months - Checked
[ ] Lines and priming bulb - Serviceable
[ ] Quality for trip running time - Checked

Electrical system

[ ] Aerial – Serviceable
[ ] All lights – Working
[ ] Battery charge/terminals - Checked
[ ] Gauges fuel, oil, power - Working
[ ] GPS and datum checked - Working
[ ] Radio check with local VMR - Checked
[ ] Sounder - Working
[ ] Switches - Working
[ ] Water bilge pump - Working

Mooring checks

[ ] Anchors – for trip area - Serviceable
[ ] Lines and fenders - Serviceable
[ ] Tides and weather - Checked
[ ] Security for boat/equipment - Checked

Safety equipment

[ ] Alternative means of propulsion - Aboard
[ ] Anchors – stowed, rigged and suitable for trip - Aboard
[ ] Bailers/bucket - Aboard
[ ] Bucket (Fire and bailing) and lanyard - Aboard
[ ] Dinghy/life raft - Aboard
[ ] Distress signalling equipment - Aboard
[ ] Divers flag - Aboard
[ ] Emergency food - Aboard
[ ] Emergency steering - Aboard
[ ] EPIRB - Aboard
[ ] Fire extinguisher - Aboard
[ ] Fresh water - Aboard
[ ] Local chart (s) - Aboard
[ ] Paddles/oars - Aboard
[ ] PFD correct size for every POB - Aboard
[ ] Sharp knife - Aboard
[ ] Small radio and batteries - Aboard
[ ] Towrope - Aboard
[ ] Waterproof torch - Aboard

Tool kit

[ ] Cable ties - Aboard
[ ] De-watering spray - Aboard
[ ] Duct tape - Aboard
[ ] Engine manual - Aboard
[ ] Fuel filter - Aboard
[ ] Gloves - Aboard
[ ] Oil/fuel funnel - Aboard
[ ] Pliers - Aboard
[ ] Propeller - Aboard
[ ] Propeller spanner - Aboard
[ ] Replacement fuses - Aboard
[ ] Sharp knife - Aboard
[ ] Shear pin - Aboard
[ ] Spare bung - Aboard
[ ] Spare fuel line - Aboard
[ ] Spare oil/hydraulic fuel - Aboard
[ ] Spare propeller - Aboard
[ ] Spare rope - Aboard
[ ] Spark plugs and spanner - Aboard
[ ] Starter cord - Aboard

First aid kit for

[ ] Burns, cuts, sprains - Aboard
[ ] Dehydration - Aboard
[ ] Hooks - Aboard
[ ] Ice, note paper and pen - Aboard
[ ] Marine stings - Aboard
[ ] Medications - Aboard
[ ] Nausea and headache - Aboard
[ ] Seasickness - Aboard
[ ] Snakebite - Aboard
[ ] Sun screen - Aboard
[ ] Special needs for children - Aboard

***Provisions** (Aboard)*

[ ] Hats and sunglasses
[ ] Long sleeved shirts
[ ] Set of underwear
[ ] Something warm
[ ] Sun creams
[ ] Wet weather gear
[ ] Sleeping, cooking, LPG

Trailer

[ ] Bearings - Serviceable
[ ] Couplings - Serviceable
[ ] Lights and indicators - Serviceable
[ ] Shackles - Serviceable
[ ] Safety chain - Checked
[ ] Spare tyre - Aboard
[ ] Tie down straps - Aboard
[ ] Tyre pressure - Checked
[ ] Winch - Serviceable

In the carpark

[ ] All straps off
[ ] Bearings cool
[ ] Bungs in
[ ] Fuel tank ready
[ ] Key in ignition
[ ] Lights away
[ ] Provisions on board

On the boat ramp

[ ] Car keys, wallet, phone
[ ] Provisions in stability checked
[ ] Safety chain off
[ ] Winch strap holding boat

WORKSHEET 6 ROUTINE MAINTENANCE

Q1. Identify one reason why you should read the manufacturer's handbook before using your motor.

Q2. Describe when should you replace old fuel in two and four stoke engines.

Q3. Explain how do you know your battery is in good working order.

Q4. Determine which of following spares is missing from the suggested tool kit for a boat in the table on the page opposite. *Spark plugs, replacement fuse, starter cord, shear pins for propeller, spare nuts and bolts, spare fuel line, spare oil and hydraulic fuel.*

Q5. Describe routine maintenance that must be done on the following areas of your boat. Use the notes to give an example of each. Eg: Engine care - Manufacturers recommend a service once a year.

Hull

Water pump

Propellers

Gearbox oil

Fuel system

LPG

Batteries

Electrical system

Spark plugs

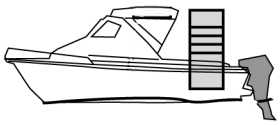
Pumps

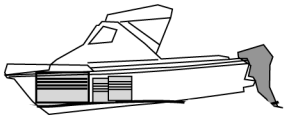
General check of boat and after every trip

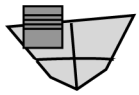
Safety equipment

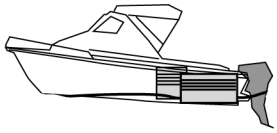
Trailer

WORKSHEET 7 CHECK STABILITY, STOWAGE AND FUELING









Q1. Draw in the water line for the boats shown opposite to show how loading affects hull position.

Q2 Explain what the skipper must do to assess the load on board.

Q3. Determine what would happen to the boat in the photograph A below. Explain how freeboard is involved.

Q4. Explain why the boat in photograph B is correctly loaded.

Q5. Justify why you use fresh fuel.

Q6. Identify three safety precautions to reduce the chance of a refuelling accident.

Q7. Calculate how much fuel would be needed for a journey of 36 nautical miles if your vessel uses 0.75 litres of fuel per nautical mile.

Q8. Calculate how far you are travelling one way (eg 40 nautical miles) if your burn rate is 15 litres per hour. You estimate your time at 2 hours from a cruising speed of 20 knots given the weather forecast and tides.

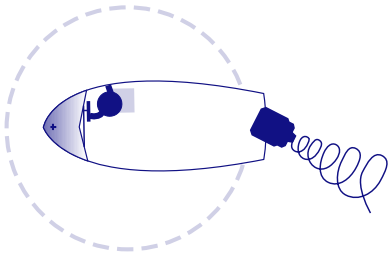
Q9. Justify suitable clothing that should be carried or worn for a day's boating,

WORKSHEET 8 SAFETY BRIEFING, LAUNCH AND RETRIEVE A BOAT

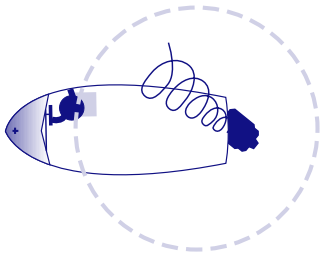
Q1. Describe four points you should cover in a safety briefing.

Q2. Justify this procedure under the general safety obligation.

Q3. Complete the pivot point diagram on the boats shown opposite from the diagrams on page 31. Explain how they differ when the boat is going ahead and astern.



Q4. Describe how you would retrieve a boat from the water, onto your trailer and back home. Identify safety procedures to avoid accidents to yourself and others.



Q5. Describe three practical things you could do on the boat ramp to avoid ramp rage. (Read the box below)

Ramp etiquette

Etiquette is the consideration of others. There are many things that make for a pleasant day's boating and many of these start at the boat ramp.

- When launching **make sure the bungs are in.**
- Get the boat into/out of the water and into the carpark as soon as possible so others can use the ramp.
- Get the boat ready in the carpark - make sure you have everything.
- Make sure the trailer tail lights are disconnected before you back the trailer into the water.
- Make sure everything you want is in the boat before you launch it.
- Prepare the boat for launch with the safety chain on winch.
- Let the bearings in the trailer wheels cool before backing into the water.
- Check the brakes and have a block to secure the towing vehicle when on the ramp and remove the block when finished.
- Have someone to assist you when the boat is in the water and you have to park the car.

WORKSHEET 9 BOATING SAFETY

Q1. Complete the table below by identifying two hazards and describing suitable control measures *(safety precautions)* for the skills listed in the first column.

Skill	Hazard	Control measure ***(safety precaution/s)***
Eg: Mount an outboard motor	*1 Waves* *2 Boat ramp*	*Move to a place where there are no waves or mount motor on the beach* *Wear shoes, work in pairs for support*
Mount an outboard motor		
Launch and retrieve a boat		
Start an outboard motor		
Depart a beach		
Return to a beach		
Depart a dock		
Dock at a jetty		
Moor at a buoy		

Q2. Describe how to drive a boat on the plane and then perform a U turn, S turn and Figure of eight. Identify the hazards and describe the safety precautions you would use.

WORKSHEET 10 SAFETY EQUIPMENT

Q1. Identify the letters A - F in Figure 1 below and explain why they are necessary makings on a life jacket

Q2. Explain your responsibilities under your general safety obligation for the items in Figure 2 below.

Q3. Explain how the information in the label in Figure 3 below helps determine when and where a life jacket needs to be taken.

Q4. Account for the differences in the life jackets A-C shown in Figure 4 below.

Figure 1

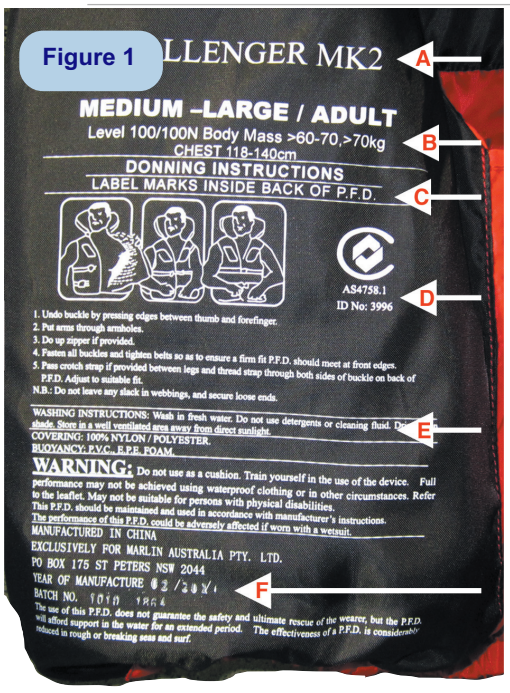


Figure 2

Figure 3

Figure 4

WORKSHEET 11 THE BOATING RULES

Q1. Identify with a circle the port and starboard marks in the photograph to the right. Describe which side you should pass.

Q2. Justify *Rule 5 - Proper lookout*.

Q3. A vessel that was fishing, suddenly approaches from your starboard bow. Describe and justify your actions.

Q4. The approaching vessel does not alter its heading. Describe the action you take under Rule 8 to avoid collision.

Q5. State Rule 6 - *Safe speed rule* and describe how it applies to the situation in the photograph above.

Q6. State Rule 17- Action by the *stand-on vessel*.

Q7. Draw arrows to show which way the boats should travel in Figures 1 - 3 below.

Figure 1

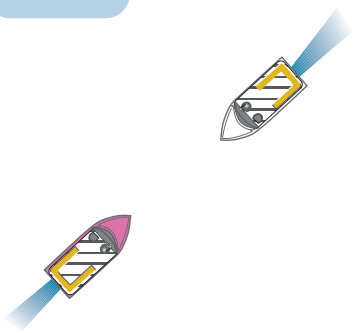


Figure 2

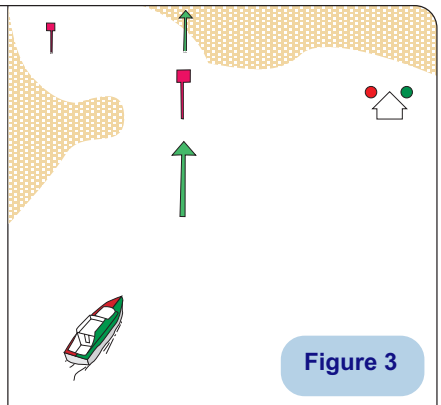
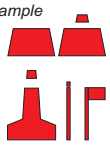
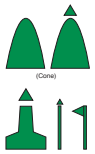
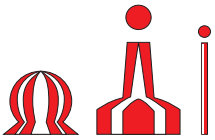
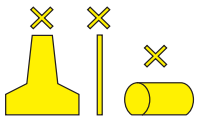
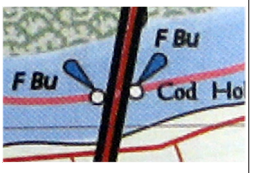
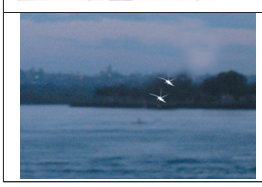


Figure 3

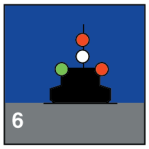
WORKSHEET 12 NAVIGATION MARKS AND SIGNALS

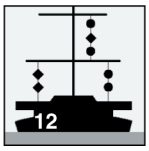
Complete the table below to identify the marks, flags and lights shown in the first column.

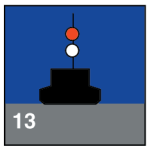
Beacon	Day shape	Side to pass	Colour	Light colour	Flashing sequence
Example  *Port lateral mark*	*Can*	*When going into port pass on port side*	*Red*	*Red*	*Various* *Check the chart*
					
					
					
					
					
					
					
					
	You see a blue light under a bridge. What does this mean?	What do these flags mean? 			
	It is night time and you see two leads flashing as follows. What should you do and why?			It is night time and you see this light. What does it mean?	

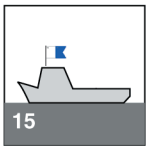
WORKSHEET 13 LIGHTS, FLAGS AND RULES

Q1. Identify the following navigation lights, safety marks and signals.









Q2. Describe the difference between lights T2, T4 and T6 shown opposite? *(Read the notes on markers on page 68)*

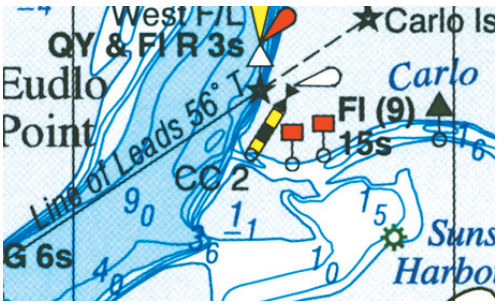
Q3. On the illustration opposite:

a. Circle the cardinal mark and indicate where safe water can be found.

b. What bearing is the line of the leads and how can you distinguish between them?

c. Circle a port light that flashes 9 times every 15 seconds. How is this indicated on the chart?

d. Circle an anchorage and a starboard light that flashes green every 6 seconds.

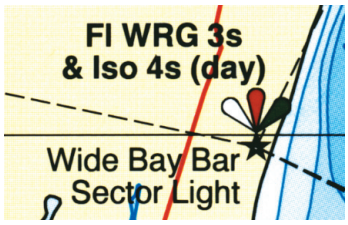


Q4. Using the chart on page 68, locate the light in the illustration to the right. Identify what type of light is it, where is it found and what colour is it from 25°48'S, 153°06'E on the chart?

Type: *Where found:*

Colour north of WP2: *Colour at WP2:*

Colour south of WP2: *Colour if viewed from land:*



Q5. Describe what this symbol indicates, where is it found and what is it used for.

WORKSHEET 14 PASSAGE PLANNING

Q1. Circle the buoyage direction symbol, a port lateral marker, a special mark and tick a starboard lateral marker in the chart below between 25°47'S and 25°50'S.

Q2. Identify the latitude and longitude of the ISO 2s light at Inskip Point and write it on the line below.

Q3. Identify the chart variation and write it on the line below.

Q4. Explain the term waypoint. Give an example. Circle and shade WP3.

Q5. You have a 4.3 m estuary run-about and want to go for a days boating in Pelican Bay. Identify what would be the best source of information for your trip.

Q6. Calculate how far is it from Bullock Point jetty in Pelican Bay, to the anchorage at Coolooloi Ck on North Island.

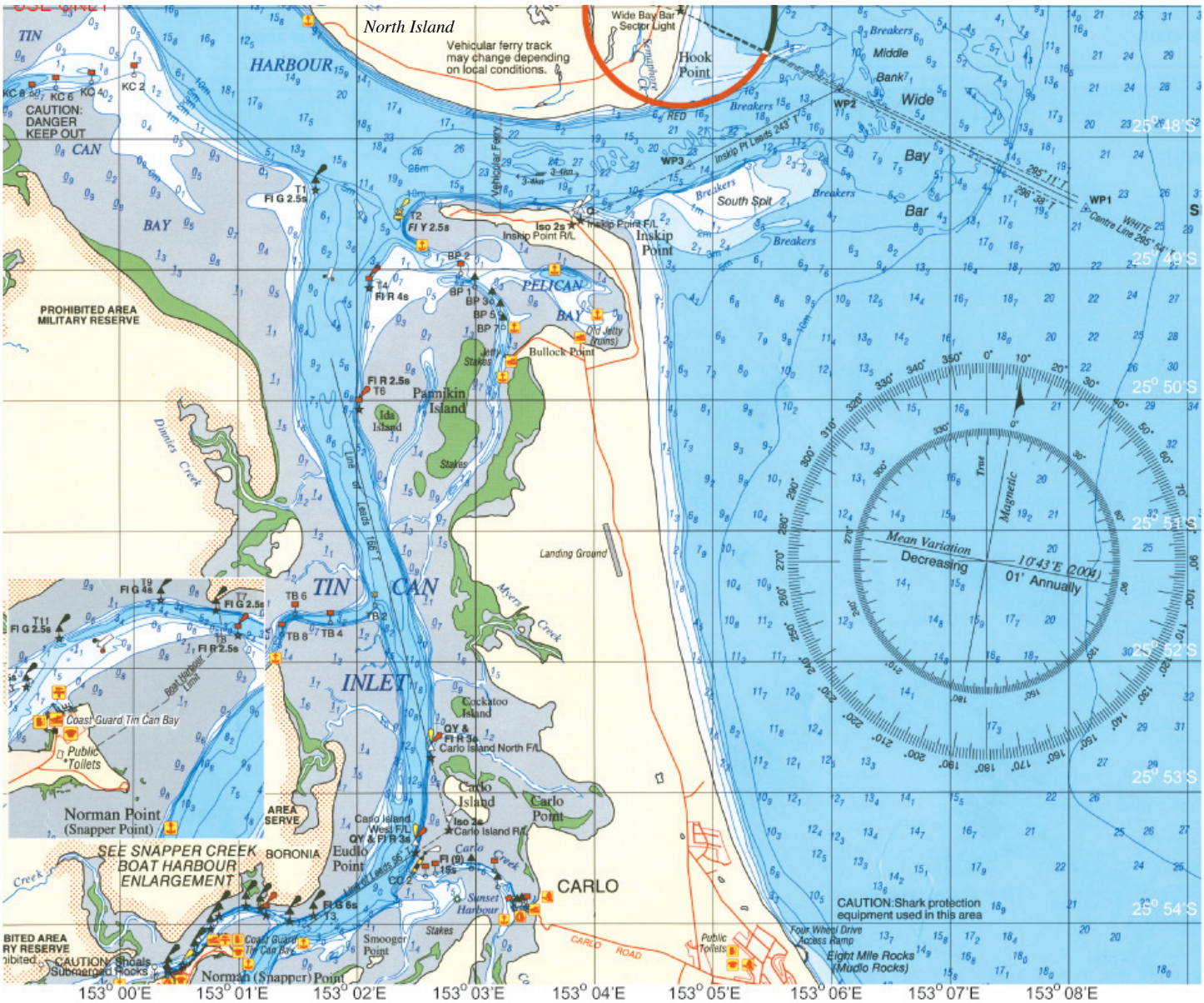
Q7. Explain why Pelican Bay is a good anchorage.

Q8. You are at 25°52'S, 153°08' E and wish to anchor overnight at Pelican Bay.

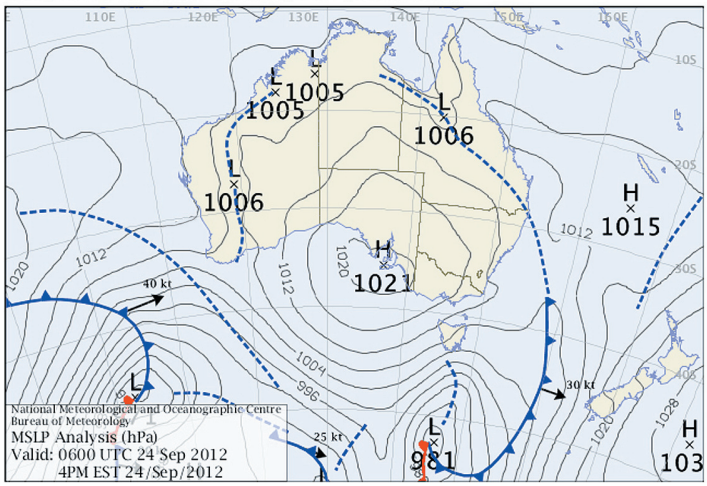
Chart a safe course to anchorage. (Your boat draws 1m of water and it is low tide).

Q9. You have a 4.3 m estuary run-about and want to go for a days boating in Pelican Bay. The forecast is for a 15-20 knot northerly with the chance of an afternoon thunderstorm. A swell of 1.5 m is expected.

Chart a safe days trip including an anchorage for lunch. The tidal range is 2.2 metres for the day.



WORKSHEET 15 WEATHER AND PASSAGE PLANNING



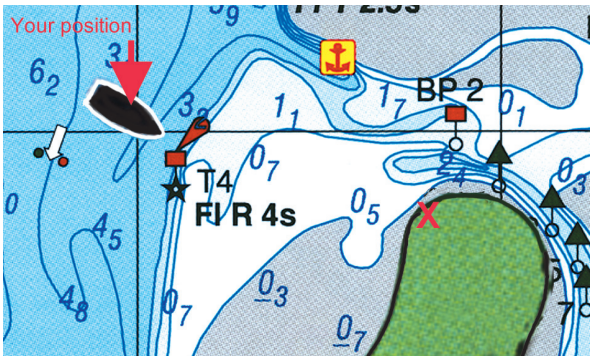
Q1. Identify the following on the weather map opposite
Trough of low pressure, ridge of high pressure, hectopascals, pressure gradient, high pressure system, low pressure system, low pressure trough, cold front.

Q2. Compare three features of high and low pressure systems in Australia.

Q3. Summarise six main points on GPS limitations and use.

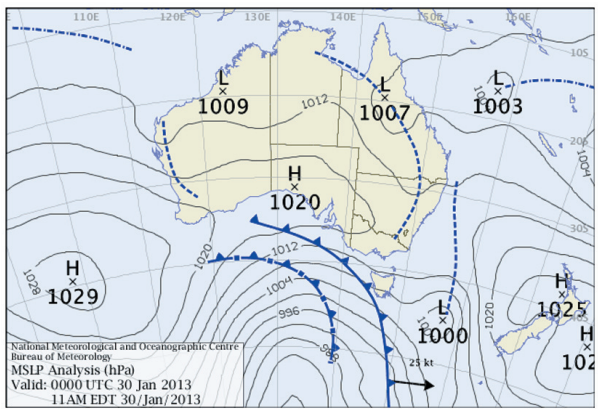
Q4. You wish to come ashore at Point X, from your position in the chart opposite and it is right on low tide. The tidal range is approx 3 metres and your boat draws 1 m.

Calculate how long will you have to wait? (You have arrived at low tide).



Q5. Identify the following in the photograph of the GPS screen opposite.
Boat's position, south cardinal mark, direction of buoyage symbol, starboard mark.

Q6. Justify a voyage plan for a day's boating in your local area for the weather map opposite with consideration of crew and vessel capabilities.



WORKSHEET 16 CALCULATE A COMPASS COURSE

The chart below, shows a typical chart with a compass rose and places to go.

Suppose you are in a bay just north west of Carlisle Island and you want to go Coffin Island - 4 nautical miles away. You calculated that by knowing a nautical mile is a minute of latitude and this was measured from the side of the chart.

The simple phrase - "cup of tea", lets you work out all compass courses from a chart that tells you the magnetic variation as shown in Figure 19.1.

From Figure 19.2 the variation in the compass rose is shown as 8 ° east.

The true to compass - easterly subtract rule applies and by using a set of parallel rules, a true bearing of 322 °T is found.

Therefore when planning a course to Coffin Island, your boat should be steered on a course of 314 ° .

Q1. Identify the true bearing from A to B by using a set of squares and circle the answer in the compass rose (Your teacher will show you how).

Q2. Identify the chart variation and determine from the cup of tea rule above, if you subtract or add.

Q3. Determine the course to steer by a compass which is not affected by any magnetic field.

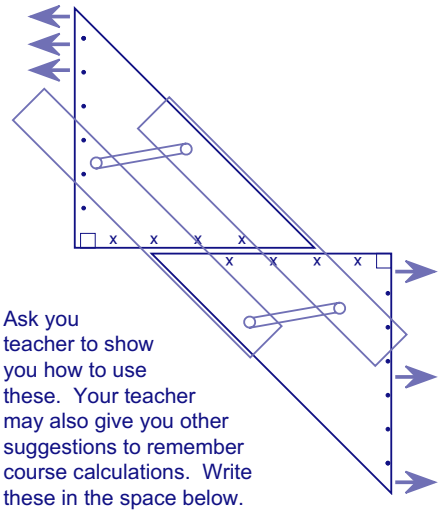
Cup of .....t e a

Compass to true easterly add

Compass to true westerly subtract

True to compass easterly subtract

True to compass westerly add



Ask you teacher to show you how to use these. Your teacher may also give you other suggestions to remember course calculations. Write these in the space below.

Figure 19.1 Compass to true easterly add

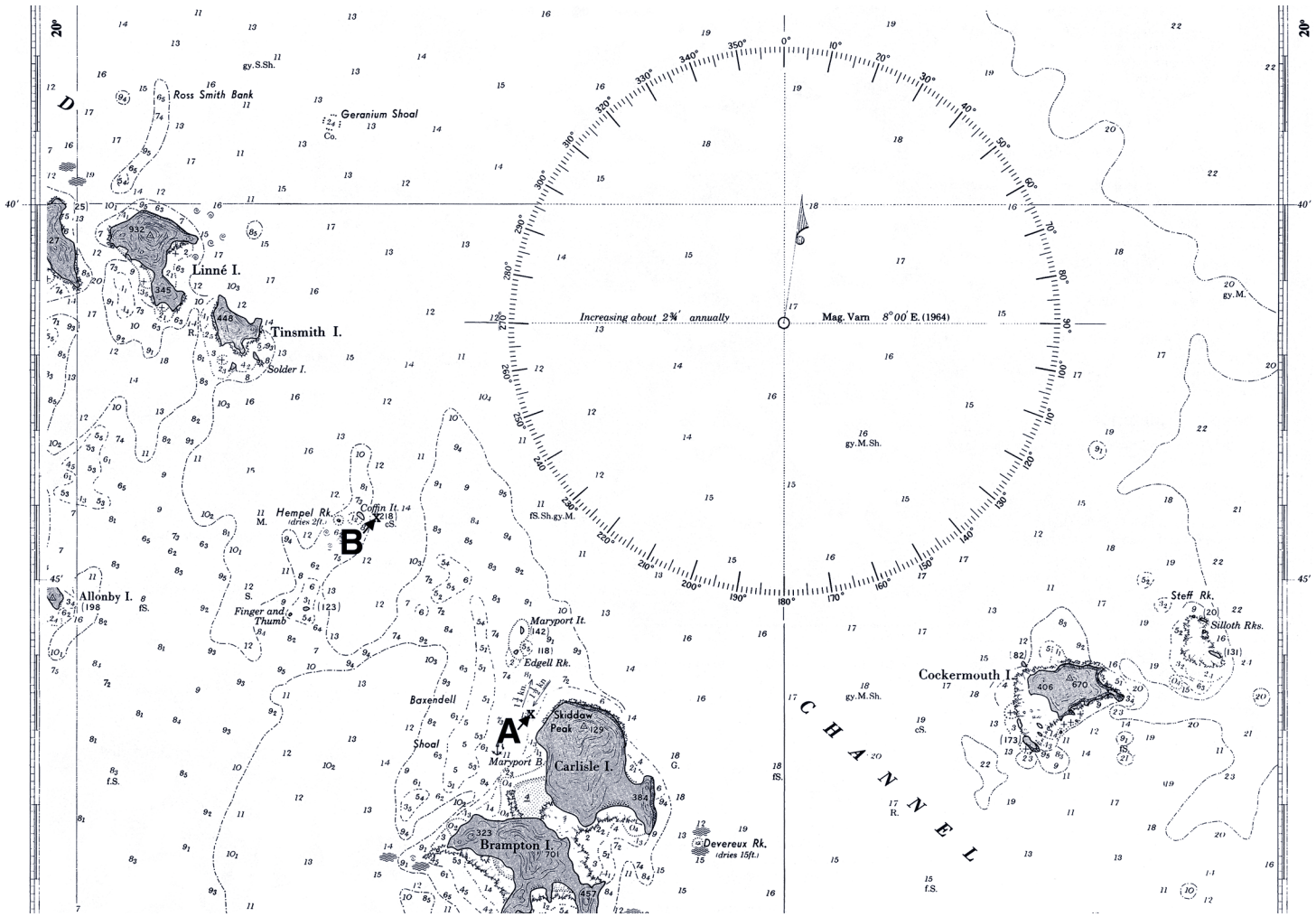


Figure 19.2 Practice chart - Error East, Compass least

WORKSHEET 17 TIDES AND PASSAGE PLANS

The next two questions refer to the tidal information opposite.

AUSTRALIA OUTER HARBOUR

LAT 25° 57' S LONG 153° 04' E

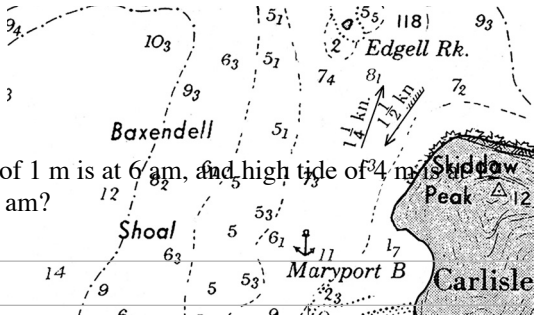
TIMES AND HEIGHTS OF HIGH AND LOW WATERS

	JUNE				JULY			
	Time	m	Time	m	Time	m	Time	m
1 SA	0427 0.73 1012 5.04 1628 0.27 2242 6.06		16 SU	0518 1.07 1104 4.41 1706 0.84 2322 5.50	1 MO	0505 0.45 1050 4.96 1701 0.11 2315 6.27	16 TU	0530 1.03 1116 4.36 1717 0.86 2331 5.39
2 SU	0515 0.64 1059 4.98 1712 0.28 2327 6.11		17 MO	0551 1.15 1135 4.30 1734 0.97 2353 5.37	2 TU	0555 0.36 1140 4.96 1750 0.15	17 WE	0559 1.07 1144 4.32 1745 0.94 2359 5.28
3 MO	0603 0.64 1148 4.86 1758 0.39		18 TU	0621 1.26 1205 4.18 1802 1.12	3 WE	0002 6.23 0643 0.36 1230 4.91 1839 0.32	18 TH	0625 1.13 1212 4.29 1814 1.07
4 TU	0014 6.04 0654 0.71 1240 4.69 1845 0.60		19 WE	0022 5.21 0650 1.37 1235 4.07 1831 1.30	4 TH	0050 6.03 0731 0.46 1322 4.79 1929 0.60	19 FR	0027 5.14 0653 1.20 1243 4.22 1845 1.25
5 WE	0102 5.85 0746 0.83 1335 4.52 1938 0.88		20 TH	0052 5.02 0722 1.48 1309 3.96 1904 1.51	5 FR	0140 5.71 0821 0.63 1417 4.65 2021 0.95	20 SA	0056 4.94 0723 1.30 1317 4.13 1919 1.48
6 TH	0157 5.58 0843 0.96 1437 4.39 2037 1.17		21 FR	0127 4.81 0759 1.59 1351 3.85 1945 1.75	6 SA	0233 5.31 0915 0.82 1518 4.54 2122 1.31	21 SU	0130 4.70 0800 1.40 1400 4.04 2001 1.73
7 FR	0257 5.30 0945 1.03 1545 4.36 2146 1.41		22 SA	0209 4.58 0845 1.68 1445 3.78 2038 1.98	7 SU	0333 4.90 1015 0.97 1628 4.51 2236 1.58	22 MO	0212 4.44 0845 1.50 1457 3.99 2100 1.95

Q1. Identify the tide heights am and pm for the standard port of Outer Harbour on the 19th July.

Q2. Estimate the height of the tide at 3 pm on the same day at Edgell Rock on the chart opposite if the tidal range was 4 m and the time of high tide was 1 pm. Depth of water at low tide is 2 m. What rule is used in this calculation?

Q3. Explain why the tide heights are different for the same day.



Q4. Estimate the depth of water under your boat in Maryport Bay. If a low tide of 1 m is at 6 am, and high tide of 4 m is at noon and your chart depth is 1.7m, how much water is under your boat at 8 am?

Q5. Explain the difference between a tide and a tidal stream.

Q6. Identify and circle the tidal streams on the chart of Carlisle Is above.

Q7. Explain how this tidal stream could affect the passage of a craft from the anchorage at Maryport Bay to Edgel Rock.

Q8. Describe where is the most accurate information can be found. How could you test the reliability of phone apps in predicting tidal information.

Q9. Describe the effect of wind over tide.

WORKSHEET 18 TIDES IN SECONDARY LOCATIONS

Q1. Calculate the tide heights and times for Inskip Point (Page 68) , a non-standard port some distance from Outer Harbour for the 1st July by using the steps below.

Step 1:

Step 2:

Step 3:

Step 4:

Step 5: .

Step 6: .

Step 7:

Step 1 Copy the information for the standard port (Outer Harbour) into Column A. This shows the times for the low and high tides for the day.

Step 2 Write time difference for Inskip Point in Column B.

Step 3 Add Column A and B to get the tide times for Inskip Point.

Step 4 In Column D copy the tide heights for Outer Harbour for the 1st July.
To calculate the tide heights for Inskip Point we need to use the following from Table 2:

- the ratio from column 9 (which is 0.8)
- the adjustment from column 10 (which is 0.47)

Step 5 In column E, multiply the ratio from Table 2 by the Height of tide Outer Harbour from (Outer Harbour).

Step 6 In column F add the adjustment from Table 2 to the value you calculated in Column E.

Step 7 Column G then has the tide heights for the secondary port.

Q2. Identify where you would launch your boat on the chart on page 68. Draw a mud map in the box above.

Tidal Planes for Secondary Places
Height Above Local Low Water Datum

TABLE 2

PLACE	Average Time Difference High Water 1	Average Time Difference Low Water 2	MHWS 3	MHWN 4	MLWN 5	MLWS 6	AHD 7	ML 8	Ratio 9	Constant 10
	H.M	H.M.	m	m	m	m	m	m		
Outer Harbour										
Burnett Heads	Standard Port		2.5	1.9	0.8	0.2	1.35	1.34		
Boonlye Point	+1 09	+0 57	2.9	2.4	1.1	0.5		1.74	1.09	+0.27
Burrum River	−0 05	−0 05	2.6	2.0	0.6	0.0		1.28	1.18	−0.31
Elbow Point	+0 35	+0 05	1.9	1.5	0.7	0.3		1.10	0 69	+0.17
Inskip Point	+0 10	−0 35	2.4	2.0	1.1	0.7		1.55	0.80	+0.47
Maryborough	+1 57	+3 00	3.0	2.4	0.4	0.0	1.29	1.44		

OUTER HARBOUR
JULY

	Time	m
1 MO	0336	0.14
	1002	2.85
	1621	0.13
	2213	2.15

Column A	Column B	Column C	Column D	Column E	Column F	Column G
Time Outer Harbour 1	Difference from Table 2 2	Time Inskip Point 3	Height of tide Outer Harbour 4	Calculations for height of tide Inskip Point: Ratio from Column 9 5	Adjustment from Column 10 6	Inskip Point Tide Heights 7
LOW 0336	-35 mins	LOW 0301	0.14 m	.8 X 0.14 m = -0.11 m	.47 .47 + 0.11 m	LOW = 0.58 m
HIGH 1002	+ 10 mins	HIGH 1012	2.85 m	.8 X 2.85 m = 2.28m	.47 .47 + 2.28 m	HIGH = 2.75 m
LOW 1621	-35 mins	LOW 1546	0.13 m	.8 X 0.13 m = 0.10 m	.47 .47 + 0.10 m	LOW = 0.57 m
HIGH 2213	+ 10 mins	HIGH 2223	2.15 m	.8 X 2.15 m = 1.72 m	.47 .47 + 1.72 m	HIGH = 2.19 m

Wet Paper

WORKSHEET 19 THE SKIPPER'S BOATING SAFETY OBLIGATION

Q1. Describe the general safety obligation of the skipper.

Q2. Explain by way of dot points, four simple rules to avoid breaching your general safety obligation (GSO) that involve a boat being safe, properly equipped, operated properly and a skipper's planning for emergencies.

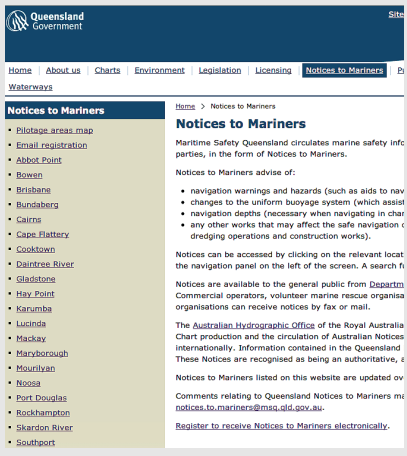
Notice to mariners

Notices to mariners advise of:

- navigation warnings and hazards (such as aids to navigation which may have been destroyed, missing or unlit),
- changes to the uniform buoyage system (which assists with the correction and updating of marine charts),
- navigation depths (necessary when navigating in channels with depth restrictions),
- any other works which may affect the safe navigation of vessels in coastal waters and ports (such as dredging operations and construction works).

The Australian Hydrographic Office of the Royal Australian Navy is the Commonwealth authority responsible for AUS Chart production and the circulation of Australian Notices to Mariners that are distributed nationally and internationally.

- Information contained in the Queensland notices is regularly reproduced in the Australian notices.
- These notices are recognised as being an authoritative, accurate guide on marine charts.
- Notices to mariners are listed on the www.hydro.gov.au website and are updated overnight.



Notice to mariners see www.hydro.gov.au

WORKSHEET 20 COMPLYING WITH YOUR STATE REGULATIONS

Q1. Identify the type of licence or ticket required in your State to operate a powerboat and the conditions imposed on it.

Q2. Describe the speed limits for your State and the variations that may apply in your local area.

Q3. Identify the requirements for boat registration and identification in your State.

Q4. Identify the water limits in your State and those in your immediate area.

Q5 Explain how far do you have to stay away from swimmers in your State.

Q6. Identify the reportable incidents for your State and when they have to be reported.

Q7. Account for the boat safety equipment for your State the table below.

Item	Required	Details of water limits
Bilge pump		
Fire extinguisher		
Anchor		
Life jacket		
Flares red/orange		
Flares parachute		
Pumping/bailing equipment		
Navigation equipment		
Drinking water		
Manual propulsion		
EPIRB		
Other		

USE WEB REFERENCES ON THE INSIDE COVER FOR THE LATEST REGULATIONS

WORKSHEET 21 YOUR BOAT'S COMPLIANCE

You're the skipper - You're responsible!

Summarise the equipment and labelling for your boat in your State in the box below.

State

Vessel's name

Registration numbers, size, visibility and location

Registration label location and expiry date

Call sign (if radio fitted)

Carrying capacity label or builders plate location and number of people the boat can carry

Range of vessel (where the design will allow the boat to go and the type of crew required)

Fuel tank volume and maximum range

Safety equipment on board, location (how stowed for easy access), condition and expiry dates (if applicable)

Emergency contacts

Maintenance tasks to be carried out, on what, when and by whom

USE WEB REFERENCES ON THE INSIDE COVER FOR THE LATEST REGULATIONS

WORKSHEET 22 ANCHORING

Q1. Describe four factors that make for a good anchorage.

Q2. Describe how to drop and raise an anchor.

Q3. Describe how to anchor in a crowded anchorage to prevent damage to other boats.

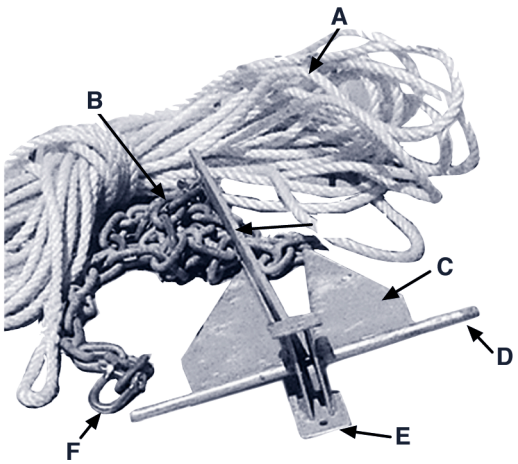
Q4. Identify how much anchor warp would you use in the situation opposite.

Depth 7 m
2 m tidal range
Moderate wind conditions
Wave height 1 m
Freeboard 1m

Q5. Identify the anchors shown in the illustration to the right and complete the information below.

Anchor name	Use

Q6. Identify the parts of the anchor A - F in the diagram opposite.



Q7. Explain why shackles are moused.

WORKSHEET 23 FIRE FIGHTING

Read the information in the box below, then answer the following questions.

Q1. Describe four basic steps in using a fire extinguisher.

Q2. Explain what should you do if a fire occurs on a small boat.

Q3. Identify four common causes of fire on boats.

Q4. Explain what should you do if you see a boat on fire.

Fight a fire

Common causes of fire

- Engine backfiring in air laden with combustible vapour.
- Hot exhaust pipe igniting adjacent to combustible materials.
- On inboard boats, fuel lines can leak or rupture and spray fuel over hot exhausts.
- Spontaneous combustion of oil rags in badly ventilated compartments.
- A spark caused by static electricity during refuelling.
- Fuel vapours collecting in the bilge due to spillage during refuelling.
- Leaking LPG which is heavier than air and will find the lowest point in the boat - usually the bilge.
- Short-circuiting and overloading the electrical system.

Control measures (safety precautions)

- Have the correct fire extinguisher on your boat - your dealer will advise you of this.
- Keep the bilge and engine room clean and free of rags, newspapers and combustible materials.
- Regularly check that engine rooms are properly ventilated.
- Use only appliances such as stoves and heaters that are approved for marine.
- Never use cigarette lighters or matches while searching in lockers - use a battery powered torch.
- Check fuel systems at regular intervals for leaks and spillage.
- Any spare petrol should be carried in approved containers.
- Check the electrical system regularly for faults and keep all components clean as possible.

Emergency drill examples

- If a fire occurs on a small boat - quickly anchor the boat and jump overboard and swim away from the boat.
- If you hear an audible alarm on a bigger boat, eg a V8 petrol inboard engine, and see smoke coming from under the engine hatch you should turn the engine and the fuel supply off as a first course of action and then assess the situation.

Fighting a fire

- Raise the alarm (to others on board and to rescue association).
- Try to remove one of the elements in the fire triangle shown above.
- Manoeuvre the boat to operate with the least wind (generally downwind).
- If a burning object can be safely moved, get it over the side quickly.
- Shut off fuel lines and gas lines as soon as possible as these may collapse and add to the fire.
- If an outboard catches fire, flood the cowling with water from your bucket and if possible remove cowling and put out fire

LPG gas leaks and fires

- LPG is the most dangerous substance on boats if not handled correctly. Leakages cause suffocation and explosions.
- In the event of fire, remove LPG cylinders from the heat source or try to keep the cylinder cool by spraying water on it. If flames threaten to engulf the cylinder - evacuate the boat.
- Safe LPG gas practices include turning off all gas appliances when leaving the boat, check that appliance cocks are closed before opening the cylinder valve, turn the gas off at the cylinder before turning off the appliance, know the smell of LPG, check gas for cylinder gas leaks with bubbles of detergent water, install a gas detector.

Helping another boat on fire

- Be very careful of boats on fire and leave the fighting of fires to the experts. If you need to become involved maintain the safety of yourself and your crew as a first priority.

Electric installations

- Frequent fires and explosions on boats occur due to short circuiting. A check once a year by a qualified electrician is a good idea.

WORKSHEET 24 DEAL WITH ENGINE FAILURE

Read the information in the box below, then answer the following questions.

Q1. Identify three things that could happen if your cooling system became clogged.

Q2. Explain what could be wrong if your motor runs irregularly or misses.

Q3. Explain what could be wrong if your motor does not start.

Q4 Propose two things that could happen if your propeller was damaged,

Deal with engine failure

Re-read pages 13-17, as well as the following information and answer the questions below.

Outboard trouble-shooting chart

- Learn to distinguish the sound of a vessel not running normally by talking to other boaties and your local dealer
- Anchor your boat before attempting to carry out on water repairs
- Work under a waterproof cover to stop the ignition from getting wet
- Use the table below to identify engine failure causes if the motor,
  - does not start,
  - runs irregularly or misses,
  - starts momentarily and cuts out,
  - does not idle properly,
  - speed is faster /slower than normal,
  - does not develop normal boat speed,
  - overheats.
- Identify situations when to take it to the repair shop.

A Motor does not start
B. Runs irregularly or misses
C. Starts momentarily and cuts out
D. Does not idle properly
E. Motor speed faster than normal
F. Motor speed slower than normal
G. Does not develop normal boat speed
H. Motor overheats
* Inspection should be performed by an authorised dealer

Note:

Replace two stroke fuel after three months and all other fuel after 6 months

A	B	C	D	E	F	G	H	Possible cause
•		•						Fuel tank empty or vent screw closed
•			•					Motor is cold
•		•						Fuel line is not connected
•	•	•	•		•	•	•	Fuel line pinched or kinked
•	•	•	•		•	•	•	Fuel filter(s) in need of cleaning *
•	•	•	•		•	•	•	Air leak in fuel system *
•		•	•					Low speed mixture screw mal-adjusted
			•		•	•	•	Wrong oil in fuel mixture
	•		•		•	•	•	Wrong petrol in fuel mixture
			•		•	•	•	Not enough oil in fuel mixture
	•		•		•	•	•	Too much oil in fuel mixture
•								Motor flooded
•	•		•		•	•	•	Spark plugs fouled or defective
	•		•		•	•	•	Wrong type spark plugs
•								No spark *
•	•	•	•		•	•	•	Weak spark or intermittent spark *
					•	•	•	Water pump failure *
					•	•	•	Cooling system clogged *
				•		•		Propeller damaged
				•	•	•		Tilt angle not correctly adjusted
				•	•	•		Boat improperly loaded
					•	•		Transom too low
				•		•		Transom too high
	•				•	•	•	Excessive spark advance *
					•	•		Insufficient spark advance *
				•	•	•		Propeller of wrong pitch or diameter

Courtesy Mariner Outboards

WORKSHEET 25 USE A RADIO

Q1. Identify the licence required to operate a marine radio.

Q2. Describe the frequencies a marine radio uses for distress and calling.

Q3. Quote an example of a radio check with a local VMR.

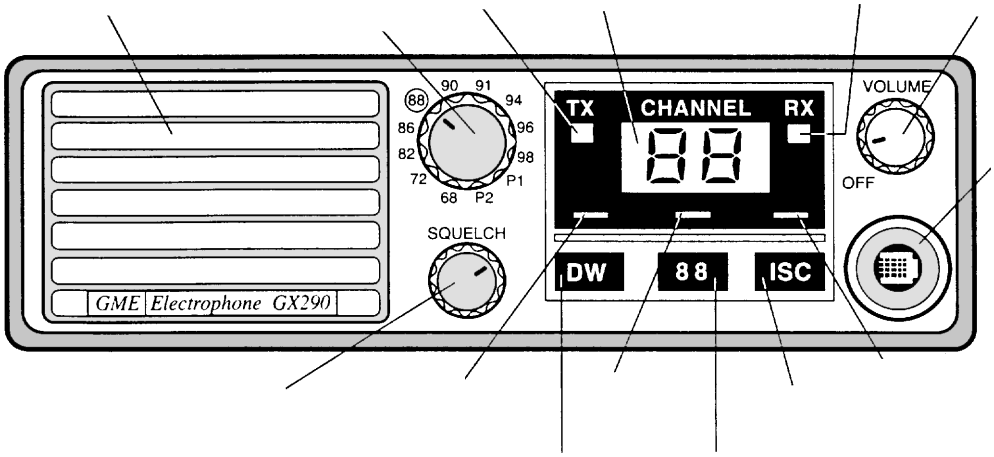
Q4. Explain when is a MAYDAY call is used and how is it different from a PAN PAN and SECURITE.

Q5. Quote a mayday call from the information on the previous page.

Q6. Explain why VHF sets are preferred over 27MHz sets.

Q7. Explain why it a bad idea only to rely on a mobile phone for emergency communications.

Q8. Identify some common controls and functions of the radio shown below.



WORKSHEET 26 ACTIVATE SIGNALLING DEVICES

Read page 44, the information in the box opposite and answer the questions below.

EPIRBS

Q1. Explain what an EPIRB is and when should it be activated.

Q2. Describe which EPIRBs will not be supported after 2009.

Q3. Identify the correct EPIRB to buy after 2009.

Q4. Explain how do to activate a 406 Mhz EPIRB.

How to activate

406 MhZ Manual type - make sure the EPIRB is vertical. Break the tamper seal and switch on. After three minutes a red light will flash indicating the EPIRB is transmitting.

Use

EPIRBs should only be used as a last resort. First use other communications or signalling equipment.

In the event of an emergency, communication should first be attempted with others close by using radios, phones and other signalling devices. Mobile phones can be used but should not be relied upon as they can be out of range, have low batteries or become water-damaged.

Expiry dates

EPIRBs have expiry dates and should not be kept past these.

Accidental activation

The most important thing to do is to switch off the beacon and notify the Australian Rescue Coordination Centre as soon as possible by calling 1800 641 792 to ensure a search and rescue operation is not commenced.

There is no penalty for accidental activation.

Storage

Store EPIRBs in an accessible place .

Note

Under new 2012 regulations, the Australian Maritime Safety Authority registration sticker for an Emergency Position Indicating Radio Beacon (EPIRB) must be affixed to the EPIRB.

Q5. Explain why is it inadvisable to dispose of an EPIRB in the garbage bin.

Q6. Explain the significance of the terms - HexID and UIN.

Flares and other signalling devices

Read page 45-46 and answer the questions below.

Q1. Explain what a V sheet is and how should it be used.

Q2. Explain what parachute flares are and when should they be used.

Q3. Describe how to ignite a hand flare and when it should be used.

Q4. Identify which type of flare should be used at night and day.

WORKSHEET 27 CAPSIZED, FLOODED OR GROUNDED BOAT

Q1. Describe how to right the capsized boat in the figure opposite. Explain safety procedures you would put in place if this happened offshore.

Q2. Describe what instructions you will give your crew if you had to abandon ship.

Q3. Describe what actions you should undertake to avoid hypothermia as an individual and as a group.

Q4. Describe how to treat a person suffering from hypothermia.

Q5. Describe what you should do if your boat becomes grounded.

Q6. Describe what you should do if your boat becomes flooded with water. Describe the suggested requirements for your State.

Q7. List any 6 signals used to indicate an emergency. (See page 44).

WORKSHEET 28 EMERGENCY PLANNING

Q1. Complete the following pieces of emergency information and telephone numbers for your local area.

Local VMR call sign: _____ Emergency poisoning: _____

Local police telephone: _____ Emergency advice: _____

Common area of operation: _____ Approx time to boat ramp: _____

Other important information: _____

Q2. Outline plans for the following boating emergencies in the table below:

a. Your car and trailer are missing when you go to get it from the car park.
b. The prop gouges a 25 mm laceration in your friend's leg from the ankle to the knee.
c. You are crabbing in bare feet, 3 nautical miles from the boat ramp and you stand on a stonefish.
d. Your Grandfather complains of severe chest pains 6 nautical miles from the boat ramp.
e. Your motor breaks down 2 hrs from return.
f. Your boat collides with another vessel and is flooded with water from a hole in the hull.
g. Your boat collides with another vessel and your friend get knocked overboard.
h. Your fishing mate has forgotten sun protection and gets seasick.
i. You have just left and your friend has left his bag behind under a tree.

Emergency	Proposed plans
a.	
b	
c.	
d.	
e.	
f.	
g.	
h.	
i.	

3. Describe one thing you could do to communicate the cessation of an emergency to appropriate personnel.

Q4. Outline boat emergency plans for situations A - C below.

A. Emergency planning for engine failure.

The situation - You and two friends are out for a day's fishing past Middle Harbour. You are about 2 nautical miles out when your motor fails. You have all the correct safety gear and a VHF radio. There are boats in the distance.

i. List and describe three (3) things that you will do in order of priority, to ensure your safety and ultimate rescue. Give reasons for each action.

Plans and reason/s

ii. List three reasons why your motor may have failed.

B. Emergency planning - Bad weather predicted

The situation - The afternoon arrives after a great clear sunny morning. You notice the sky is becoming black on the horizon and there are large puffy clouds above the black sky. It is two hours to return.

i. Describe how you would prepare for your return journey.

Plans and reason/s

ii. What plans would you make for getting your family safely off the boat and into the car if a hailstorm hit at the boat ramp?

Plans and reason/s

C. Emergency planning - stowage and access to emergency equipment

i. How do you know what safety equipment is to be carried/worn/used in accordance with state/territory legislation and weather and light conditions?

ii. Complete the table below by identifying how you would stow the safety items for easy access and how to make sure they are in good working order. Note for column 3, choose from the numbers 1 - 9 from the Column 3 key box below.

	①	②	③	④
Item	*Name*	*How to stow for ease of access*	*How to check if in good working order*
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13				
14.				
15.				

Column 3 key

How to stow numbers

Choose a number to answer the questions for column 3

1. Locked in a box
2. Mounted at the helm
3. In lockers or under bow of boat
4. In crate to allow water to drain
5. In safety grab bag
6. In crate with safety grab bag, out of packets
7. Stowed in cabin or tied to seats
8. Stowed in cabin in watertight container
9. In cockpit so can get to when driving.

WORKSHEET 29 FIRST AID AND RESCUE

Wet Paper

Figure 33.1 V sheet on a disabled boat

Q1. Describe how would you help the family in the Figure 33.1.

Q2. Describe one good piece of advice to passengers on seasickness.

Q3. Describe how should you treat a coral cut.

Q4. Describe what you should do if the prop has just gouged a deep laceration in your friend's leg.

Q5. Describe what you should do if you find someone in the water suffering from severe hypothermia.

Q6. Describe the treatment for nontropical Bluebottle stings.

Q7. What should you do to relieve the pain for someone who has been stung by a jellyfish in tropical waters.

Q8. Describe how to navigate a vessel at high speed (For Yachting Australia candidates).

WORKSHEET 30 HANDLE ADVERSE CONDITIONS

Summarise how to handle adverse conditions head on, side on and stern on.

Your RMDL

By completing the information below you will have satisfied the criteria necessary to obtain your Recreational Marine Drivers Licence (RMDL). Your instructor will test your theory and practical skills to verify your competence.

A sample practical task checklist detailing all the criteria is available at www.msq.qld.gov.au

From time to time, Boatsafe Information Bulletins (BIBs) are issued by Maritime Safety Queensland which may alter these details.

Wet Paper will send out errata sheets to take on board these changes, and alter this form in the next print run.

If you don't drive a boat for some years after you obtain your RMDL, a refresher course is highly recommended.

Medical fitness disclosure statement

Completed by candidate

Statement by Licence Candidate

I, (insert family and given name in block letters)

……

declare that I, have / do not have (delete as required) a medical condition or other impairment that may prevent the discharge of my general safety obligation to operate a recreational vessel or personal watercraft safely under the Transport Operations (Marine Safety) Act 1994.

I understand that it is an offence under the Transport Operations (Marine Safety) Act 1994 to state in a document that I know will be given to the chief executive, the General Manager or an officer of the Department of Transport and Main Roads information that I know is false or misleading. Maximum penalty 200 penalty units.

…… .....

Date Signature of licence candidate

Time in training vessel - Transfer total to the other side when complete.

Completed by candidate

Use the table below to log the time you spend in your training vessel to become competent to drive that vessel. Transfer total to other side when complete.

Date	Time in	Time out	Total	Vessel's Name	Date	Time in	Time out	Total	Vessel's Name

Theory questions completion record

Completed by school BTP

Worksheets 1 - 30 test the candidates ability to competently discharge their boating safety obligation. The candidate is required to sign on page 112 that they have completed these worksheets, corrected their mistakes and state that the work is their own. If there are any doubts or irregularities, the school BTP will comment here.

School BTP comment:

S/BTP Initial:

Course evaluation *(Rate the course elements from A (highest) to E (lowest).*

Completed by candidate

Theory element	*A*	*B*	*C*	*D*	*E*
Ch 1 Boat systems					
Ch 2 Pre-trip checks etc					
Ch 3 Basic skills					
Ch 4 Safety equipment					
Ch 5 Boating rules					
Ch 6 Trip planning					
Ch 7 Regulations					
Ch 8 Emergencies					
Ch 9 Advanced skills					

WA RST Practical assessment		
RST Task	*C*	*NYC*
Task 1		
Task 2		
Task 3		
Task 4		
Task 5		

RST Task	*C*	*NYC*
Task 6		
Task 7		
Task 8		
Task 9		
Task 10		
Task 11		

Candidates comment:

FILE THIS COPY AT SCHOOL

This form subject to MSQ Audit

Records to be kept for 3 years

It is no longer necessary to send this page to Yachting Qld. All that is required is to complete the spreadsheet issued to the school BTP from Yachting Queensland and email this to *btp@qldyachting.org.au*

For any issues, please ring YQ on (07) 3393 6788

SCHOOL TRAINING RECORD

Enrolment date: _____

It is no longer necessary to send this page to Yachting Qld. All that is required is to complete the spreadsheet issued to the school BTP from Yachting Queensland and email this to *btp@qldyachting.org.au*
For any issues, please ring YQ on (07) 3393 6788

YACHTING QUEENSLAND BoatSafe

Family name

Given name/s

School or address

Candidates date of birth

Answers to theory test version

	(a)	(b)	(c)	(d)		(a)	(b)	(c)	(d)
1					26				
2					27				
3					28				
4					29				
5					30				
6					31				
7					32				
8					33				
9					34				
10					35				
11					36				
12					37				
13					38				
14					39				
15					40				
16					41				
17					42				
18					43				
19					44				
20					45				
21					46				
22					47				
23					48				
24					49				
25					50				
	(a)	(b)	(c)	(d)		(a)	(b)	(c)	(d)

Student verification

Student ID or Drivers licence number and issuing State

State

I certify that

- I have completed the time I have spent in a training vessel (page 111), corrected the mistakes I have made and understand the answers to the questions as indicated in my National Powerboating Workbook.
- I certify also that during my BoatSafe course I had the practical assessment tasks listed below demonstrated to me and was then given sufficient opportunity to practice these tasks and to demonstrate basic proficiency.
- I certify that the information on pages 111 and 112 is my own and is true and correct.

....
Student signature Date

Practical assessment results

As per BoatSafe Jan 2012 competency standard pages 14 and 15

Task 1: Leave and return to launching facility or berth ☐

Task 2: Bring a recreational vessel alongside a floating object ☐

Task 3: Moor and anchor a recreational vessel ☐

Task 4. Manoeuvre a recreational vessel underway ☐

TOTAL TIME IN TRAINING VESSEL - *from page 111* HRS

Statement of competency number

From the book issued by Yachting Queensland

Registration of vessel

In which majority of practical test took place

Assessment schedule (✓)

Schedule A ☐ (MAP or Marine Studies/Science Course)

Assessor verification

BTP Name

Provider number

I certify that I have examined the candidates workbook and the tasks and questions identified on pages 111 and 112 have been completed.

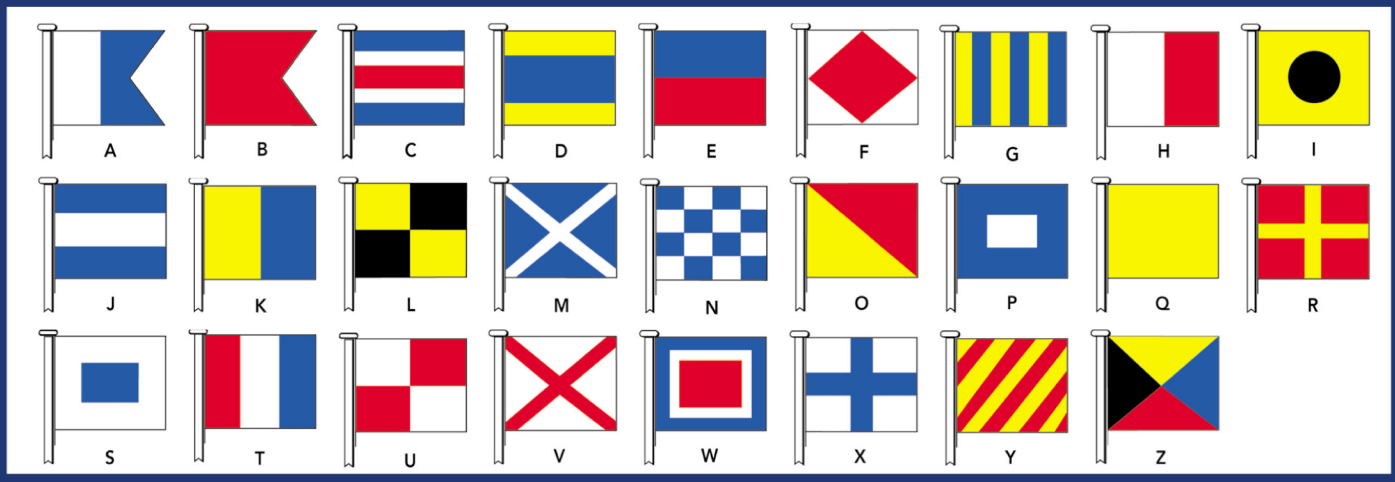
Overall result (✓)

Competent ☐

Not yet competent ☐

....
Signature Date

FILE THIS COPY AT SCHOOL
This form subject to MSQ Audit *Records to be kept for 3 years*



www.wetpaper.com.au

978-1-86283-122-3

National Powerboating Workbook

Worksheets

BoatSafe

Boat Smart
taking young boaters beyond the basics

SKIPPER'S TICKET

YACHTING AUSTRALIA

NATIONAL POWERBOATING WORKBOOK 8TH EDITION