Marine Science

For Australian Students

National Powerboating Workbook

Suggested answers

Errata

See page 13 for new figure 1

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Contents

You're the skipper -
You're responsible!

Wet Paper

WORKSHEET 1 AT THE BOAT RAMP

Launching

Q1. Explain the following terms.

Hazard: *A hazard is something with the potential to cause harm.*

Risk: *A risk is the likelihood that harm will occur from exposure to the hazard*

Control measure; *A control measures are actions that can be taken to reduce the potential of exposure to or removal from a hazard.*

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

Oysters and glass

Slippery ramp with algae

Other boats, cars

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

Make sure the brake is on and chock the wheels

Wear shoes to prevent cuts and from slipping

Make sure all children are safety sway from the launching area

Carry out pre-checks and inspections. Make sure boat glides easily on rollers or skid pads

When winching a boat on the trailer never stand in line with the winch cable.

Q4 Justify four winch safety tips.

Check the condition of the winch cable and replace repair broken strands - could break

Keep the winch cable and components greased - could become stuck

Unwind the winch cable so that it is ready upon return - easy recovery

Inspect the winch cable for damage to avoid breaking under strain - could break

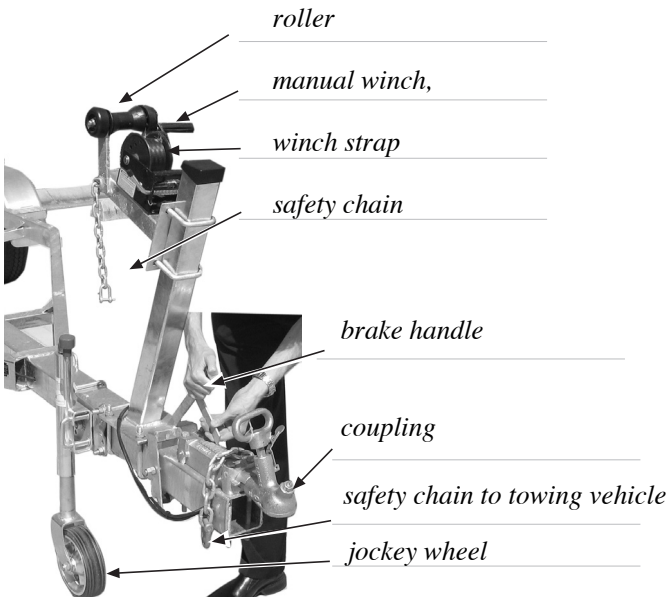
Never stand in line with the winch cable in case it breaks - could get head. eye, arm damage

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

Use a bracket to support the motor - it stops the motor from bouncing up and down while towing and protects the tilt mechanism.

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 care and maintenance procedures for the winch, lights and bearings of a trailer.

Winch handle - inspect for wear, lubricate

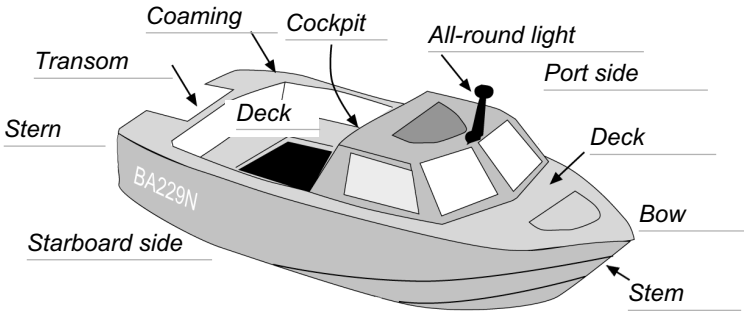
Safety chain - inspect for corrosion, repair or replace

Winch cable - inspect for corrosion, repair or replace

Coupling - inspect for wear, lubricate

Jockey wheel - inspect for corrosion, repair or replace

WORKSHEET 2 BOAT PARTS AND HULL COMPLIANCE



Q1. Indicate where the following parts of a boat can be found 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.

The freeboard is the distance from the gunwale to the water. Most often this will vary along the length of the boat and can even be the lowest point of the transom.

The gunwale is the upper edge of a boat's side; the part of a vessel where hull and deck meet. (Pronounced "gunnel")

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

You will break or seriously compromise the hull

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

An overloaded boat has reduced freeboard (see figure 5.3) and can easily be swamped

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

A planing hull will make a boat rise slightly out of the water so that it is gliding over the water rather than ploughing through it . It requires power to get the boat to planing speed.

The displacement hull only needs a small amount of power to move due to the large amount of water displaced due to its larger size and load.

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

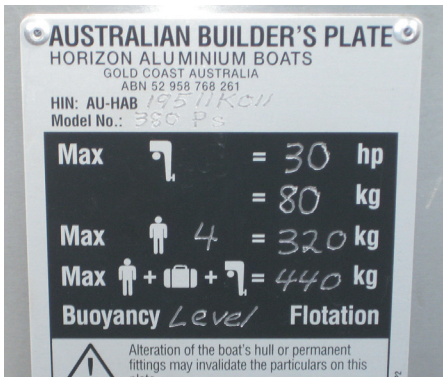
Basic flotation - the boat will remain afloat either by the bow or upside down

Level flotation means the boat will remain in a level position

Q7. Identify which of the boats on page 4 would you take over a bar.

Deep V, twin engine, rigid inflatable, catamaran and tri-hull

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

30 hp with a weight of 80 kg

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

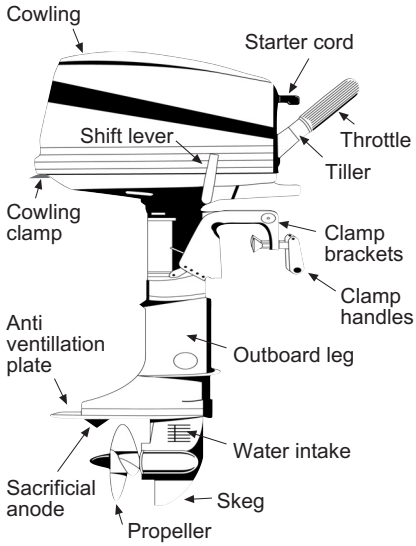
You would need 4 adults within a healthy weight range or 2 adults and 2 children.

The esky would have to weigh no more than 20 kg

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

Account for by bigger sized crew, weather or other loads carried in the boat eg extra fuel, and he weather forecast

WORKSHEET 3 ENGINES AND FUEL



Q1. Identify where the following parts of a outboard can be found on the diagram opposite.

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: Runs diesel cheaper

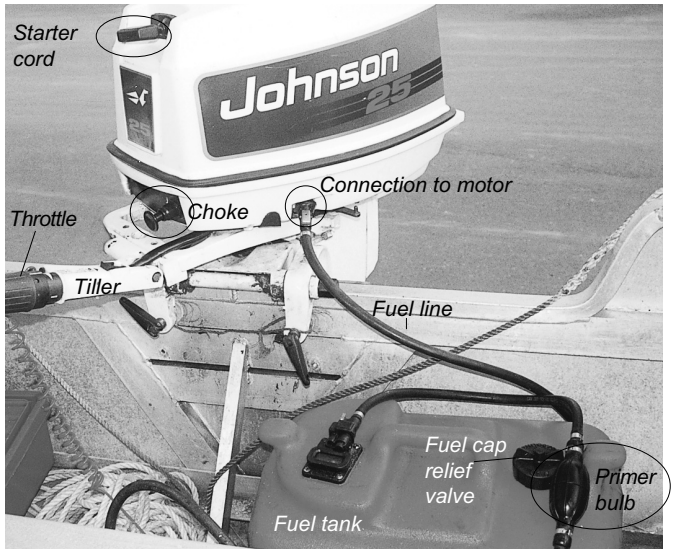
Disadvantage: Cannot transport motor to mechanic

Outboard: Advantage: Faster

Disadvantage: Fuel more expensive

Stern drive Advantage: Easier steering

Disadvantage: Cannot transport motor to mechanicing



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 is a "tell tail" does.

It indicates to the skipper that water is cooling the motor

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

A boat's battery is used continually to run critical electrical systems such as the radio, GPS, console equipment, lighting and navigation instruments.

Q6. Describe two maintenance requirements for modern engines.

If the motor has been run through mud or even worse sand, the impeller should be inspected for damage and replaced if worn.

The oil reservoir needs to be checked before each trip

Check the water intake and around the prop before leaving as it may be blocked by fishing line or plastic bags.

Q7. Describe the function of the safety lanyard.

If the driver falls out of the boat, the power to the motor is cut and the boat will stop.

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

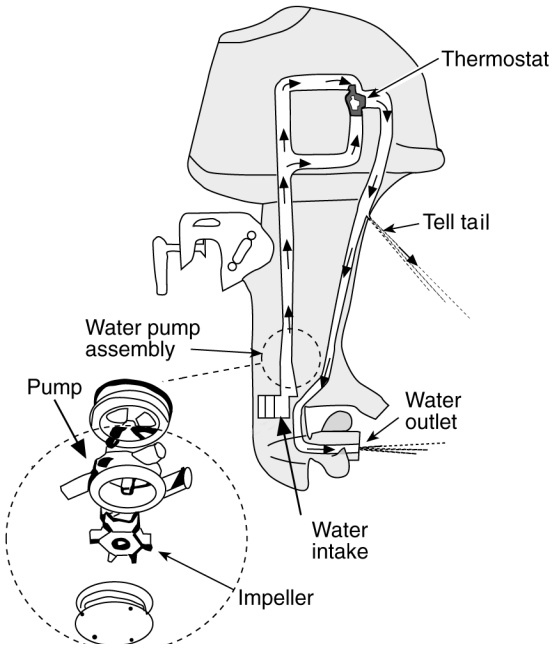
Pump, impeller, water intake, water outlet, water pump assembly, thermostat, tell tail.

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.

To drive cool water through the water pump

By driving the boat in sand or mud



WORKSHEET 4 BERTHING AND STEERING

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

A spring line is a pivot line used in docking, undocking, or to prevent the boat from moving forward or stern while made fast to a dock.

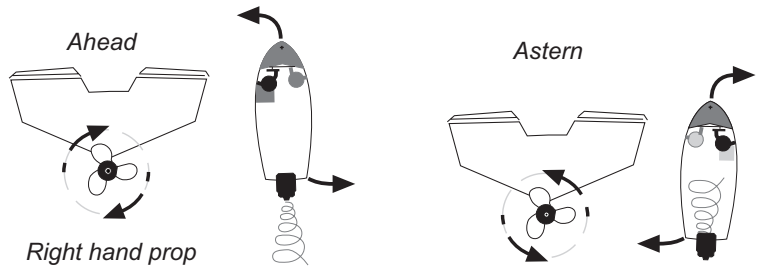
Q2. Describe a use for fenders.

Fenders are designed to protect the hull of the boat as well as secure it at a jetty

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

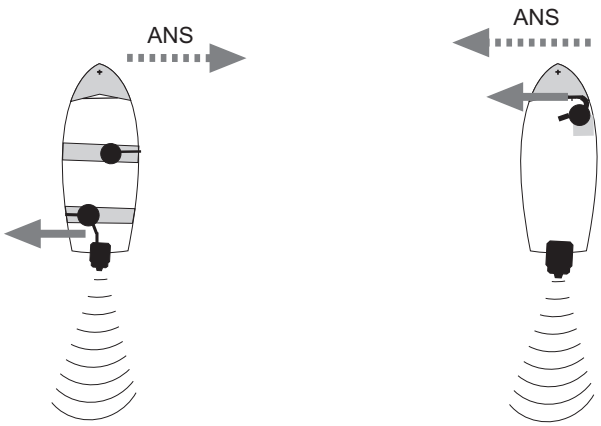
You could breach your general; safety obligating.

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

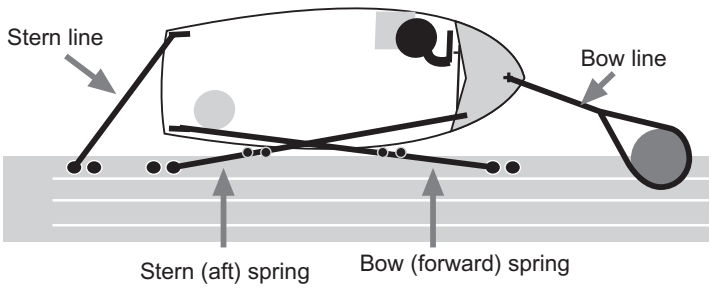


Q5. Indicate by means of arrows, which way the bow will swing if the tiller or steering wheel is pulled or turned to the left in the diagrams opposite. Account for the difference.

Transverse thrust



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

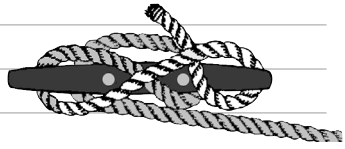
Nylon is a good mooring line because it is incredibly strong, very stretchy, and resists the harmful effects of sunlight.

Q8. Describe how to tie off to a cleat.

First make a full turn around the base of the cleat. Follow with two figure of eights.

Finish with a full turn.

If you intend staying for a while replace the full turn with one half hitch.



WORKSHEET 5 ROUTINE MAINTENANCE

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

To make sure you follow the right procedures and servicing schedules

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

Every three months

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

By having the electrolyte checked or checked by a service centre

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

Fuel filters, spare bung

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

Check for damage repair if necessary

Water pump

Replace the impeller regularly, especially if you have been operating in the shallows and stirring up sand.

Water pump impellers can deteriorate quickly.

Propellers

Keep shafts and props clean and in good working order and remove fishing line.

Gearbox oil

Check propeller shaft for caught line.

Fuel system

Carry spare fuel if required in the right container.

LPG

All LPG cylinders and appliances need to be fixed and in an upright position so they don't move.

Batteries

Keep terminals and cable clamps corrosion-free. Use a wire brush or hot water to remove corrosion.

Coat terminals with non-flammable terminal protectant to prevent future corrosion.

Electrical system

Keep all electrical fittings dry.

Spark plugs

Carry new ones in your tool kit with a spanner to change them.

Pumps

Test bilge pumps for effective operation and service as required.

General check of boat and after every trip

Check all screws, bolts and other fittings to keep secure.

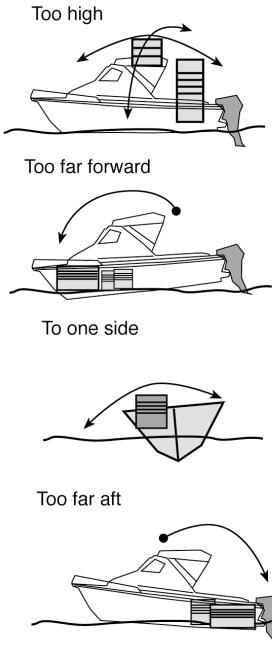
Safety equipment

Inspect for any deterioration or damage.

Trailer

Bearings, lights, corrosion

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.

Heavy items should be stowed in a low and central place where they cannot move around.

Weight, including passengers, should be distributed evenly through the boat.

Passengers who are also heavier than normal (ie 80 kg) should be positioned to avoid flooding over the transom.

The weight of extra fuel, water and provisions should be accounted for and if you experience rough conditions, secure the cargo

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

Risks being flooded by next wave

Not enough freeboard

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

Passengers and driver well balanced

Load in centre and low down

Oars stowed

Q5. Explain why you use fresh fuel.

Old fuel will not run the motor

Q6. Identify 3 safety precautions to reduce the chance of a refuelling accident.

Remove tank from boat and fill at fuel station away from boat in a well ventilated area.

Leave room in tanks to allow for expansion

refuel in a well ventilated space and wipe all spills.

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.

If you use .75 Litres in 1 nautical mile you will use 36 X .75 = 27 Litres

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.

15L/hr x 2hrs = 30 L

30L x 3 = 90 litres

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

Hat, sunnies, long sleaved short, jumper or rain jacket, life jackets for children, carry water and personal medications

ALL - Protection against sunburn, hypothermia, wind burn

WORKSHEET 8 SAFETY BRIEFING, LAUNCH AND RETRIEVE A BOAT

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

• Point out the different types of safety equipment carried. For example if you are going offshore you will need to show the flares and EPIRB and how to use them.

• Identify the location where equipment can be found and confirm that everyone has understood you and answer any questions they may have.

• Identify where you will be going for the day, the type of conditions they can expect, how long till the next toilet stop or the need for footwear or protection from elements.

• Remind crew about stability and safety. Never stand or sit on the bow of a boat while the boat is departing or leaving. Have all crew seated safely before you take off.

Q2. Justify this procedure under the general safety obligation.

If you don't do it you will get a fine

Id there is an emergency the passengers won't know where the safety gear is found

Q3. 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.

1--> Drive up on beach near ramp or moor beside jetty

2--> Mate gets towing vehicle.

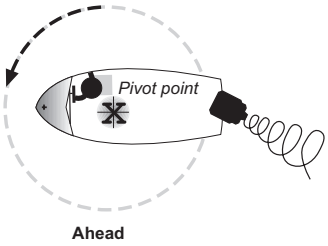
3--> Guide mate to tell when to stop trailer in water.

4--> Unwind winch, line up centre of boat with trailer, connect winch cable.

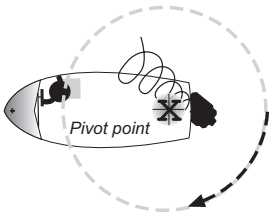
5--> Mate winds winch while you guide boat onto trailer (not standing in line with winch cable).

6--> Hook up safety chain and mate drives boat off ramp.

7--> In carpark prepare for taking home.



Ahead



Astern

Q4. 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.

See page 31

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

Slip on ramp injuring body. No bow line on boat to hold as it comes `off trailer - boat floats off to sea.

Not ready - boat does not come off trailer quickly.

Motor does not start - was not checked at home.

Not having someone to assist you when the boat is in the water.

Checklist: Launch a boat from a trailer

[ ] Prepare boat and trailer for launch
[ ] Observe good ramp etiquette
[ ] Launch boat
[ ] Tempororarly secre boat for loading
[ ] Remove and pack the vehicle and trailer
[ ] Depart eh launcgh area

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 bearing 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

Describe control measures *(safety precautions)* listed on pages for the skills listed in the table below, by identifying any two hazards and then completing the table.

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	*Eg Motor*	*Use two to carry if too heavy, use protective boots*
Launch and retrieve a boat	*Eg Ramp*	*Use protective boots*
Start an outboard motor	*Eg Pull cord*	*Warn crew when pulling*
Depart a beach	*Eg Prop*	*No one in water when starting*
Return to a beach	*Eg Beach*	*Everyone to be seated until boat stops*
Depart a dock	*Eg The dock*	*Keep fingers and hands inside boat*
Dock at a jetty	*Eg Motor*	*Use appropriate revs and gears*
Moor at a buoy	*Eg Boat hook*	*Advise and watch ends of pole*

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.

[ ] Check that it is safe, no interference to other vessels and eater users [ ] Advise crew of what you are about to do

[ ] Bring vessel on to plane

[ ] Check that it is safe, no interference to other vessels and eater users [ ] Advise crew of what you are about to do

[ ] Perform U turn

[ ] Check that it is safe, no interference to other vessels and eater users [ ] Advise crew of what you are about to do

[ ] Perform S-turn

[ ] Check that it is safe, no interference to other vessels and eater users [ ] Advise crew of what you are about to do

[ ] Perform Figure of 8

[ ] Check that it is safe, no interference to other vessels and eater users [ ] Advise crew of what you are about to do

[ ] Bring vessel off the plane

WORKSHEET 10 SAFETY EQUIPMENT

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

A PFD type and model identification

B Intended mass range

C Illustrations for donning

D Standards symbol

E Instructions for care and storage

F Manufacturer's name, date of manufacture, batch number

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

You have to explain where the equipment is located and what it does and how to use it in case of an emergency

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

It tells you the chest size and the max weight the life jacket can support

It gives a number you can match with your States Safety Equipment Water Limits table

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

A: For use in smooth, partially smooth and open waters Not to be used by personal watercraft (PWC) riders, skiers or people being towed.

B: For use in smooth and partially smooth waters Keeps you afloat but does not have a collar to keep the head above water.

Can be used by skiers or people being towed in smooth or partially smooth waters.

Can be used by PWC riders in smooth and partially smooth waters or beyond those waters.

C: For use in smooth waters and only where the user is likely to be in the water for a short time.

Can be used for skiers or people being towed in smooth waters.

Can be used by PWC riders in smooth waters

Figure 1

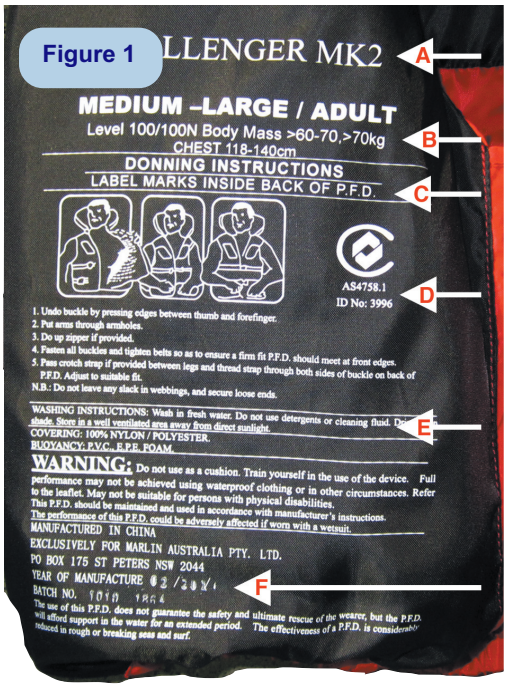


Figure 2

Figure 4

WORKSHEET 11 THE BOATING RULES

Q1. Identify the following in the photograph to the right. Port and starboard markers and identify which side you should pass.

To pass port to port

Q2. Justify *Rule 5 - Proper lookout*.

This means that you should constantly look out and listen for any other vessel or obstruction - if you don't you could kill someone

You must use all available means to look out (including hearing, and sound).

Be particularly careful, especially in bad weather, restricted visibility, in darkness, at anchor, when sleeping or when the sun is shining into your eyes.

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

If on your starboard side appears it is your duty to keep clear

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

Any action to avoid a collision shall be positive, in ample time and with due regard to the observance of good seamanship.

The take all actions to avoid colliison

Q5. State Rule 6 - the safe speed rule and describe how it applies to this situation.

At all times you must proceed at a safe speed so as to avoid collision and be able to stop in an appropriate distance.

You must take into consideration:

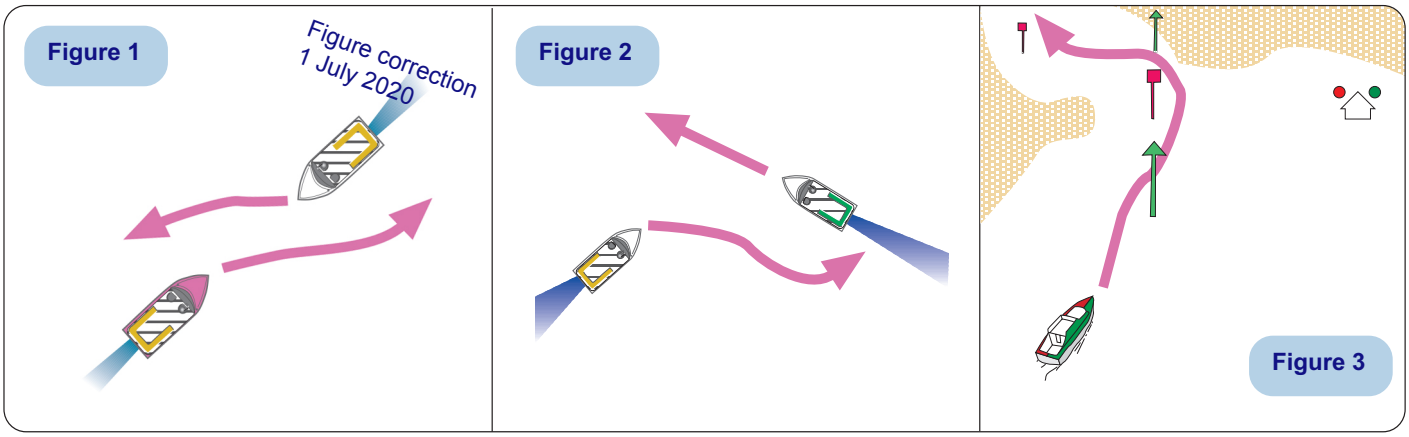
- *the state of visibility,*
- *traffic density (including fishing or other vessels),*
- *manoeuvrability and draft of the vessel,*
- *at night the presence of background light and the state of the sea,*
- *your ability to manoeuvre in wind and current.*
- *Always keep a safe distance. Generally the faster the speed - the greater the distance.*

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

The stand on vessel shall maintain course and speed until it is obvious that the other vessel is not giving way as shown below.

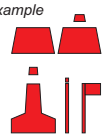
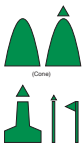
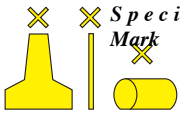
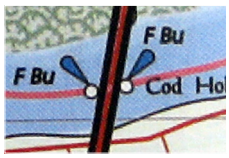
The stand-on vessel should then take whatever action as is necessary to avoid collision.

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



WORKSHEET 12 NAVIGATION MARKS AND SIGNALS

Identify the marks, flags and lights in the table below.

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*
 ***Starboard lateral mark***	*Cone*	*When going into port or upstream pass on starboard side*	***Green***	***Green***	***Various***
 ***East cardinal Mark***	***Two separated cones - top facing up, bottom facing down***	***Safe water to the east - consult chart***	***East is black/yellow/ black. (cones point up and down)***	***White***	***3 flashes in a group***
 ***North cardinal Mark***	***Two separated cones - both facing up***	***Safe water to the north - consult chart***	***North is black upper with yellow base. (direction of cones is up)***	***White***	***Uninterrupted flash***
 ***South cardinal Mark***	***Two separated cones - both facing down***	***Safe water to the south - consult chart***	***South is black base with yellow upper. (cones point down)***	***White***	***6 flashes in a group + 1 long flash***
 ***West cardinal Mark***	***Two separated cones - both facing inwards***	***Safe water to the west - consult chart***	***West is yellow/ black/yellow. (cones point into centre)***	***White***	***9 flashes in a group***
 ***Isolated Danger Mark***	***The top mark has two black spheres positioned vertically and clearly separated.***	***Some type of local danger - wreck, shoal - consult chart***	***Two black balls separated clearly***	***White flash***	***The light comprises a white flash showing groups of two***
Safe Water Mark 	***Painted red and white vertical stripes and have one red ball on the top.***	***Safe water beyond this point***	***Red and white vertical stripes. Ball is red***	***White flash***	***A white light followed by a period of darkness.***
 ***Special Mark***	***The top carries a yellow cross***	***Consult your chart***	***Yellow cross***	***Yellow flash***	***Yellow flash other than that used for the white lights above***
	You see a blue light under a bridge. What does this mean? ***A blue channel mark.*** ***Keep to the right of the channel.***	What do these flags mean?  ***Proceed at slow speed when passing***		 ***I have a diver down below. Keep clear.***	
	It is night time and you see two leads flashing as follows. What should you do and why? ***These are leading lights. You are too far to starboard. Move to port but when in line keep to the right of the channel.***		It is night time and you see this light. What does it mean? ***There is a vessel under 50 metres at anchor***		

WORKSHEET 13 LIGHTS, FLAGS AND RULES

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

Sailing vessel
Port side

Sailing vessel
Going away from you

Sailing vessel
Head on

Vessel at anchor

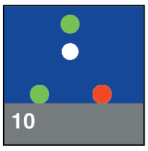
Vessel not under command
Going away from you

Fishing vessel
Head on

Power vessel
Port side

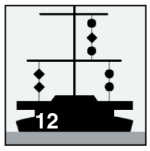
Power vessel
Starboard side

Power vessel
Head on

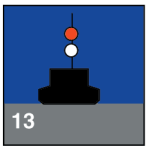


Trawler
Head on

Vessel engaged in trawling

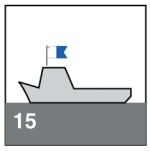


Vessel engaged in dredging - pass on side with diamonds



Vessel engaged in fishing head on - not a trawler, not making way)

Vessel restricted in ability to manoeuvre - dive vessel at night, not making way



Vessel with divers below

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

T2 is a special mark (Tin Can Bay) that flashes yellow every two and a half seconds

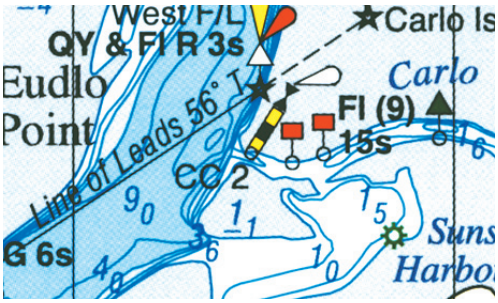
T4 is a lateral mark (Tin Can Bay) that flashes red every four seconds

T6 is a lateral mark (Tin Can Bay) that flashes red every two and a half seconds

Q3 On the illustration opposite:

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

CC2 with safe water to the west of the mark



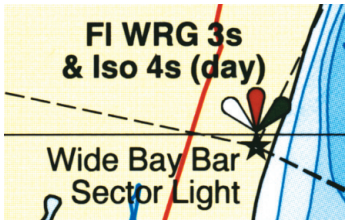
b. What bearing is the line of the leads and how can you distinguish between them?

Line of leads is 56°T . The front lead has a quick flashing yellow light and a red light that flashes every 3 seconds. The back lead flashes every 2 seconds

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

Fl (9) 15s

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: *Sectored light* Where found: *at North Island*

Colour north of WP2: *Green* Colour at WP2: *White*

Colour south of WP2: *Red* Colour if viewed from land: *Does not flash over land on part island as indicated*

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

Direction of buoyage, found on charts Navigating into port

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? *25°48.6'S 153°03'E*

Q3. Identify the chart variation. *10°43'E (2004)*

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

A waypoint is a charted feature or chosen position on a chart.

eg: WP 2 is approximately 25°47.6'S, 153°06'E

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.

Bureau of meteorology web site. The local VMR. Up to date chart.

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

Approx 3 nautical miles

Q7. Explain why is Pelican Bay such a good anchorage?

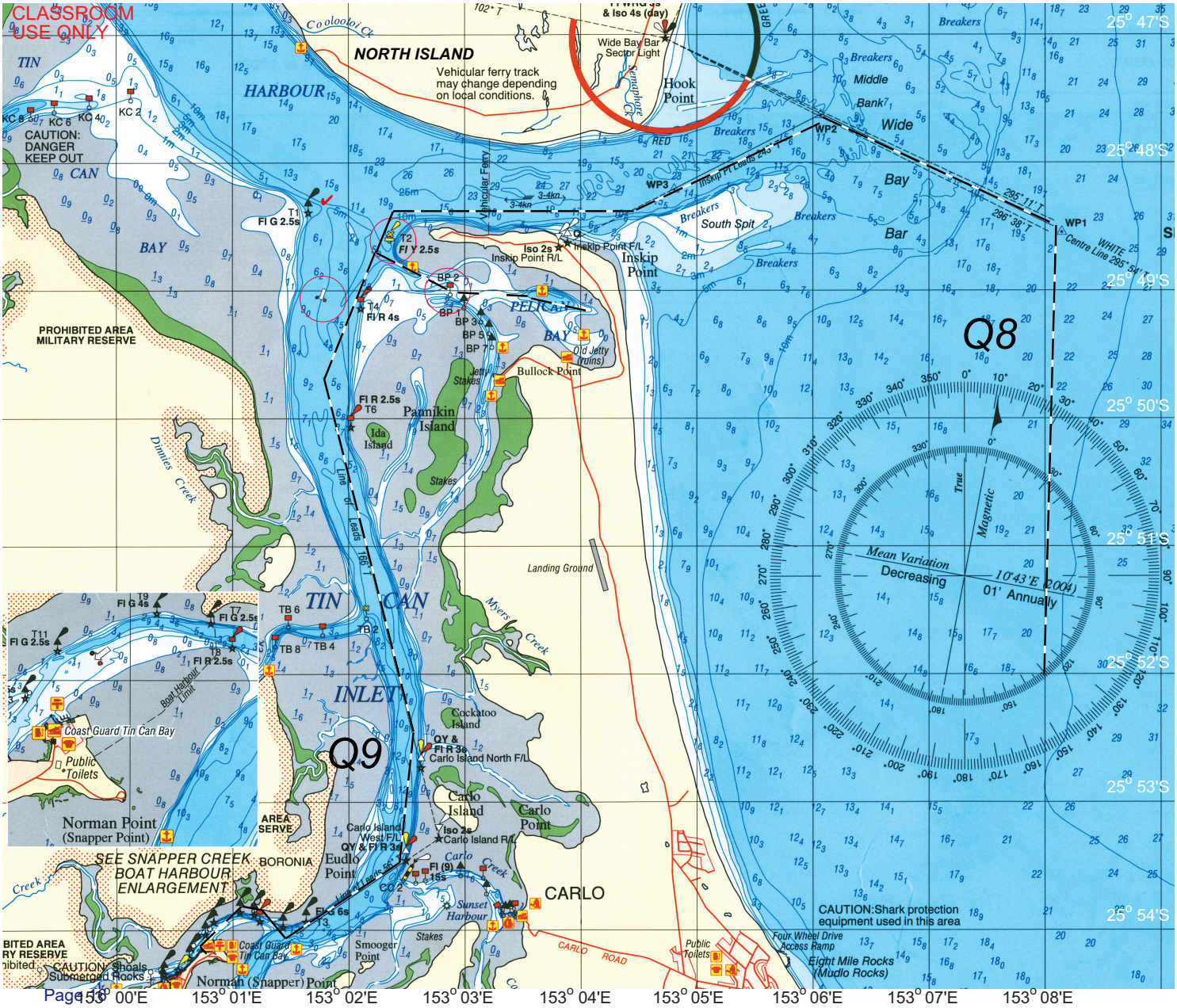
Well protected from most wind directions.

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

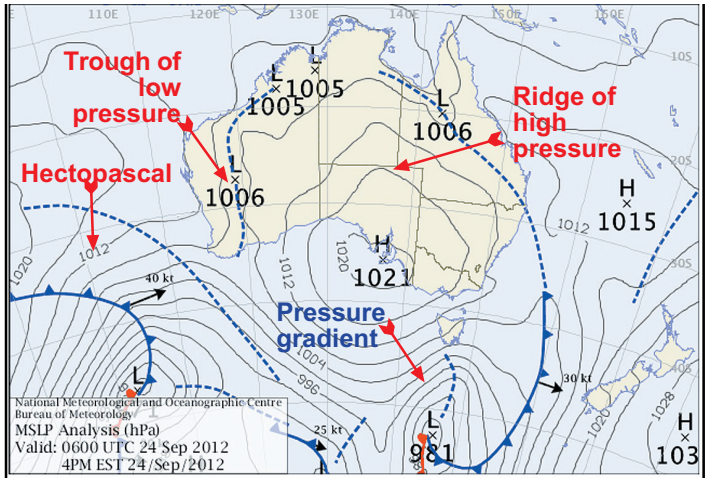
Chart a safe course to anchorage. (Your boat draws 1m of water and it is low tide)

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.

In Australia, winds blow out of highs anticlockwise,

and into lows clockwise.

High [H] and low [L] pressure systems move from east to west at various speeds.

High pressure systems are found further north in winter allowing low pressure systems to sweep over southern

Australia creating dangerous boating.

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

(1) You must always maintain a proper lookout and safe speed (2) Check that you datum is set to WGS 84

(3) Allow time for you GPS to initialise and note the number of satellites it acquires

(4) Verify your position with a chart and coastal features (5) Be aware of power failures and poor electrical connections

(6) Make sure your chart and GPS are up to date with system upgrades

(7) Check your chart between waypoints especially if you are travelling in a straight line

(8) Be aware of areas under construction or development

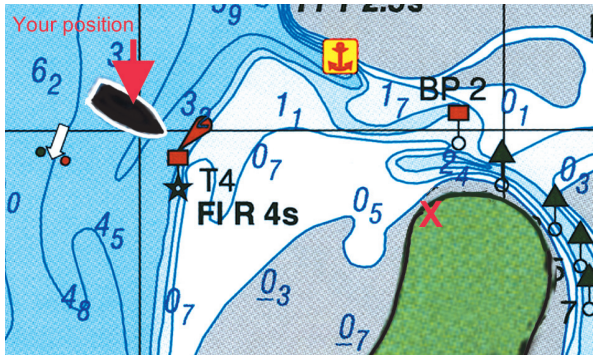
Q4. You wish to come ashore at Point X, from your position in the chart opposite and it is right on low tide. The tidal range is approx 3 metres and your boat draws 1 m.

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

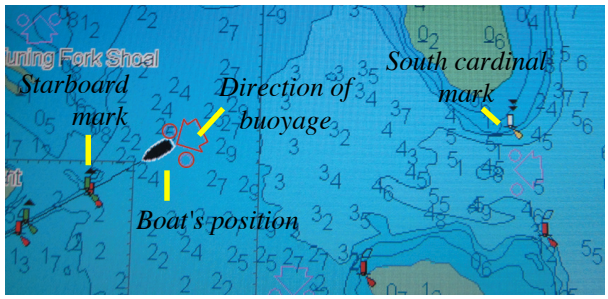
In the first hour: The tide rises 1/12 x 3 = 0.25 m

In the second hour: The tide rises 2/12 x 3 = 0.5 m

You should be able to come in two hours.

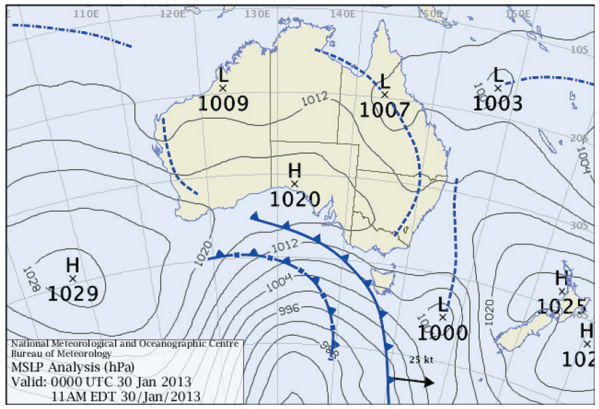


Q5. Identify the following in the photograph of the GPS screen opposite.
Boat's position, south cardinal mark, direction of buoyage symbol, starboard mark.



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.

Depends where you live.



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

From Figure 18.1 the variation is shown as 8 º east.

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

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

Q1. Identify the true bearing from A to B by using a set of squares and circle the answer in the compass rose.

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

Variation = 8ºE so you add

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

True bearing to B = 322ºT

Variation = 8ºE

Course to steer = 314ºM

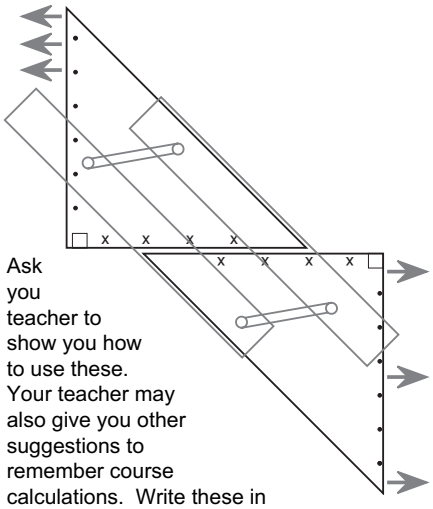
Cup of .....t e a

Compass to true easterly add

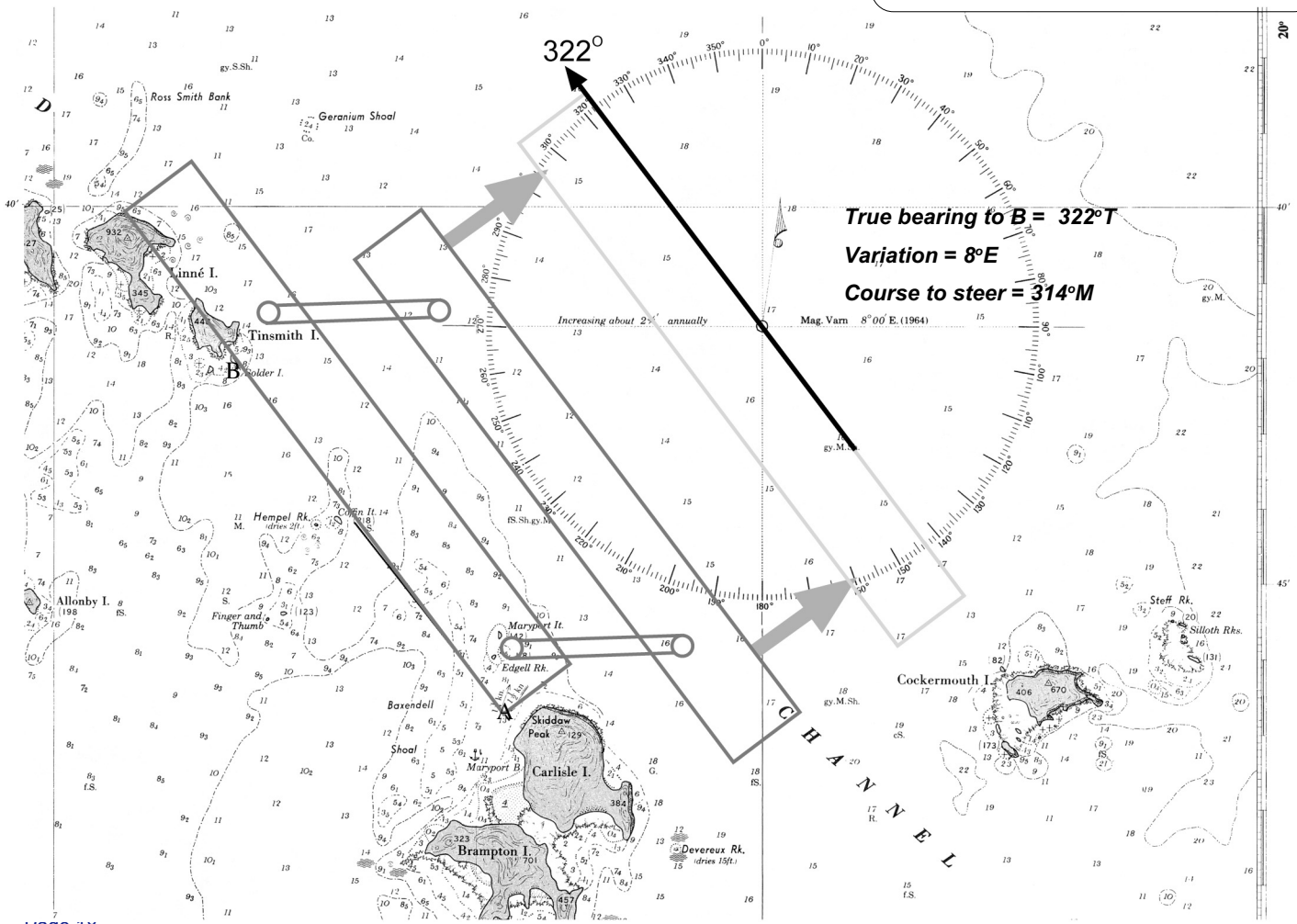
Compass to true westerly subtract

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



WORKSHEET 17 TIDES AND PASSAGE PLANS

AUSTRALIA OUTER HARBOUR

LAT 25° 57' S LONG 153° 04' E

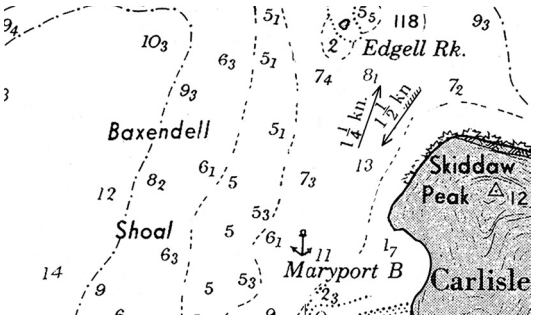
TIMES AND HEIGHTS OF HIGH AND LOW WATERS

JUNE

	Time	m		Time	m
1 SA	0427	0.73	16 SU	0518	1.07
	1012	5.04		1104	4.41
	1628	0.27		1706	0.84
	2242	6.06		2322	5.50
2 SU	0515	0.64	17 MO	0551	1.15
	1059	4.98		1135	4.30
	1712	0.28		1734	0.97
	2327	6.11		2353	5.37
3 MO	0603	0.64	18 TU	0621	1.26
	1148	4.86		1205	4.18
	1758	0.39		1802	1.12
4 TU	0014	6.04	19 WE	0022	5.21
	0654	0.71		0650	1.37
	1240	4.69		1235	4.07
	1845	0.60		1831	1.30
5 WE	0102	5.85	20 TH	0052	5.02
	0746	0.83		0722	1.48
	1335	4.52		1309	3.96
	1938	0.88		1904	1.51
6 TH	0157	5.58	21 FR	0127	4.81
	0843	0.96		0759	1.59
	1437	4.39		1351	3.85
	2037	1.17		1945	1.75
7 FR	0257	5.30	22 SA	0209	4.58
	0945	1.03		0845	1.68
	1545	4.36		1445	3.78
	2146	1.41		2038	1.98

JULY

	Time	m		Time	m
1 MO	0505	0.45	16 TU	0530	1.03
	1050	4.96		1116	4.36
	1701	0.11		1717	0.86
	2315	6.27		2331	5.39
2 TU	0555	0.36	17 WE	0559	1.07
	1140	4.96		1144	4.32
	1750	0.15		1745	0.94
				2359	5.28
3 WE	0002	6.23	18 TH	0625	1.13
	0643	0.36		1212	4.29
	1230	4.91		1814	1.07
	1839	0.32			
4 TH	0050	6.03	19 FR	0027	5.14
	0731	0.46		0653	1.20
	1322	4.79		1243	4.22
	1929	0.60		1845	1.25
5 FR	0140	5.71	20 SA	0056	4.94
	0821	0.63		0723	1.30
	1417	4.65		1317	4.13
	2021	0.95		1919	1.48
6 SA	0233	5.31	21 SU	0130	4.70
	0915	0.82		0800	1.40
	1518	4.54		1400	4.04
	2122	1.31		2001	1.73
7 SU	0333	4.90	22 MO	0212	4.44
	1015	0.97		0845	1.50
	1628	4.51		1457	3.99
	2236	1.58		2100	1.95



The next two questions refer to the tidal information opposite.

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

High tides: 5.14m (27 mins am), 4.44m (12.45 pm)

Low tides: 1.20m (6.53 am) , 1.25m (6.45pm)

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?

1/12 x 4 = 0.3 + 2/12 x 4 = 0.6,

2 + .3 + .6 = 2.9 m (ANS)

Rule of 12th's

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

This is caused by the slight difference in gravitational pull by the

moon as well as the coastline's geomorphology.

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 12 noon and your chart depth is 1.7m, how much water is under your boat at 8 am?

Chart depth = 1.7m Tidal range = 3m

Low tide = 1m

Rise of tide = (first hr 1/12 x 3 = 0.25m) + (second hr 2/12 x 3 = 0.5m)

So water under your boat (no draft) = 1.7 + .25 + .5 = 3.45 ANS

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

Tides are heights and affect the depth of water at a place on

an hourly, daily and monthly basis.

Tidal streams are horizontal water flows that result from tides.

Q6. Identify and circle the tidal streams on the chart opposite.

1.5 knots (from approx. Sth) 1.25 knots (from Nth approx.)

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

They affect courses and the duration of a passage and are shown

on a chart using tidal diamonds. These indicate the speed and bearing of the tidal flow during each hour of the

tidal cycle.

Affect fuel calculations and time of passage

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

bom web site

Q9. Describe the effect of wind over tide.

Wind over tide equals rough ride.

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: *Low 0336 High 1002 Low 1621 High 2213*

Step 2: *-35 mins, +10 mins, -35 mins. +10 mins*

Step 3: *Inskip Point Low 0301 High 1012 Low 1546 High 2223*

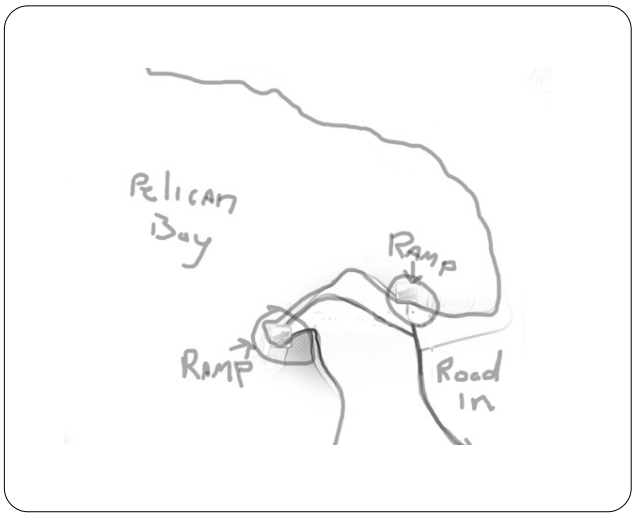
Step 4: *0.14m 2.85m, 0.13 m 2.15 m*

Step 5: *.8 x 0.14m = -0.11m; .8 x 2.85m = 2.28m; .8 x 0.13 m = 0.10 m ; .8 x 2.15 m = 1.72 m*

Step 6: *.47 + 0.11m; .47 + 2.28 m; .47 + 0.10m; 047 + 1.72 m*

Step 7: ANS: *Lows are 0.58 and 0.57m at 3am and 346pm; Highs of 2.75m and 2.19 m at 10.12aam and 10.23 pm*

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



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.

OUTER HARBOUR
JULY

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

Tidal Planes for Secondary Places
Height Above Local Low Water Datum
TABLE 2

PLACE	Average Time Difference High Water	Average Time Difference Low Water	MHWS	MHWN	MLWN	MLWS	AHD	ML	Ratio	Constant
	1	2	3	4	5	6	7	8	9	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			

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.

The general safety obligation of a skipper is nationally recognised as a maritime principle based on achieving the highest level of safety by ensuring a boat is safe, properly equipped and crewed, and operated in a safe manner

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 skippers planning for emergencies.

a. boat is safe

- *safely loaded and balanced*
- *everything is working well and complies if you have to defend yourself in court*
- *if you lend your boat out and the navigation lights don't work and there is an accident, you could be liable for prosecution.*

b. boat is properly equipped

- *safety gear, lights, seats*
- *provisions, emergency equipment*
- *if your boat gets inspected by the water police and the flares are out of date, you will cop a fine.*

c. boat is properly operated

- *licensed crew*
- *don't exceed your level of confidence*
- *skiing at night might be fun, but if an accident occurred you would be liable for prosection.*

d. Skipper plans for emergencies

- *monitor the weather and tides at all times*
- *have a good plan B for the simple things that could go wrong - engine failure, accidents*
- *if you are involved in an accident it has to be reported (different times for different states)*
- *you also have a duty of care to your vessel, your crew, other boats, people who live beside waterways*

and the passengers you take.

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 licences required in your state to operate a powerboat and the conditions imposed on it.

Q2. Identify 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
Bilge pump	
Fire extinguisher	
Anchor	
Life jacket	
Flares red/orange	
Flares parachute	
Pumping/bailing equipment	
Navigation equipment	
Drinking water	
Manual propulsion	
EPIRB	
Other	

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

Other, for example - issues with keeping a proper lookout on this boat ie visibility from the helm, tender boat markings and maximum distance from mother ship allowed before exempt from registration, impact of vessel on environment (eg bilge pump-out requirements).

WORKSHEET 22 ANCHORING

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

A good anchorage is protected from wind and waves and swells, enough depth at low tide along the full swing of the anchor and line, enough space along the full swing for a change in tide and a good bottom which will hold an anchor.

Q2. Describe how to drop and raise an anchor.

Drop - Assess conditions, select anchor, look at swing circle if appropriate, determine length based on depth, motor up into wind and tide, drop required length, secure end to clear or bollard, check for drifting.

Raise - Motor up to anchor feeding rope into locker. Give strong pull and dislodge. Stow safely.

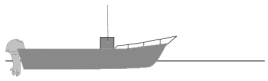
Q3. Describe how to anchor in a crowded anchorage to prevent damage to other boats.

In a crowded anchorage, always anchor in a similar fashion as the boat next to you or the two boats may drift into each other. Use a chart to see the anchorage symbol

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

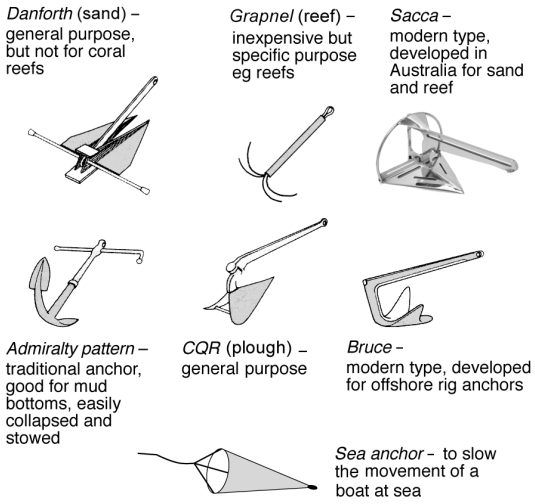
Calm conditions - 5 x 8 = 40 metres

Rough conditions 8 x 8 = 64 metres

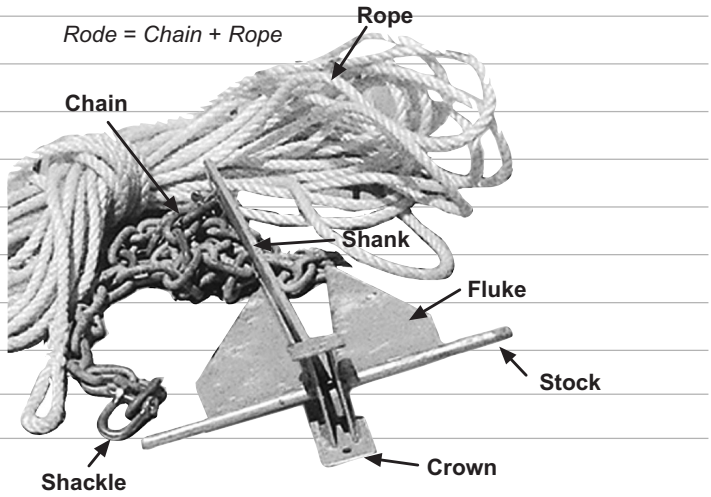


Depth 7 m
2 m tidal range
Moderate wind conditions
Wave height 1 m
Freeboard 1m

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



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



Q7. Explain why shackles are moused.

Shackles are moused whenever there is a chance of the shackle pin working loose.

WORKSHEET 23 FIRE FIGHTING

Read the information in Figure 25.1 and answer the questions below.

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

a. Pull the pin b. Aim at the base of the fire

c. Squeeze the handle d. Sweep the flames

Note: Check the instructions on the fire extinguisher. Note the type of fire it is designed for.

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

Anchor the boat if unable to extinguish, abandon ship and swim away

Q3. Identify four common causes of fire on boats.

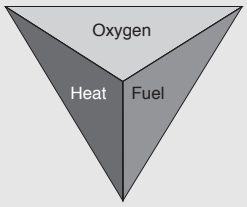
\Gas stoves leaking	*Oil or petrol rags*	*People smoking*
Methylated stoves or fuel spilling over	*Poor ventilation of bilge*	*Motor malfunction/overheating*

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

Try to assist where possible. Save people in water. Assist but DO NOT put your boat or yourself at risk.

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

- 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 Figure 26.1 and answer the questions below.

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

Motor speed slower than normal, Does not develop normal boat speed, Motor overheats

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

Old fuel, fuel line pinched or clinked, fuel filter need cleaning, air leak in fuel system, wrong fuel mixture,

too much oil in fuel mix, spark plugs defective, weak or intermittent spark, excessive spark advance

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

Fuel tank empty or vent screw closed, Motor is cold, Fuel line not connected, fuel line pinched or kinked

Fuel filter in need of cleaning, air leak in fuel system, low speed mixture screw mal adjusted

Motor flooded, spark plugs fouled or defective, no spark, week or intermittent spark

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

Motor speed faster than normal or Does not develop normal boat speed

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.

By law if you have a VHF radio fitted you are required to attend a marine radio course or sit a written test to obtain a marine radio operators certificate of proficiency (VHF or open).

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

A marine radio is normally left on Channel 16 (VHF) or Channel 88 (27mHz)

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

Redcliffe Coast Guard, Redcliffe Coast Guard, this is Reef Seeker, Reef Seeker (OVER) Wait for Redcliffe Coast Guard

- *Redcliffe Coast Guard, this is Reef Seeker Reef Seeker, am going out boating today and wanting a radio check (OVER) Wait for Redcliffe Coast Guard*
- *Redcliffe Coast Guard, this is Reef Seeker Reef Seeker, thank you (OUT)*

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

MAYDAY is a distress call when the vessel or person using it is threatened by grave and imminent danger.

PAN PAN when life is not threatened but an emergency situation.

SECURITE is when there is a navigation or weather warning.

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

MAYDAY, MAYDAY, MAYDAY, This is Sea Witch Victor Lima One, Two Three Four

Sea Witch Victor Lima One, Two Three Four Sea Witch Victor Lima One, Two Three Four

MAYDAY This is Sea Witch Victor Lima One, Two Three Four

Position 20 degrees eighteen minutes South, 150 degrees 23 minutes EAST.

HULL HOLED, Sinking, Four adults on board, EPIRB Activated. Abandoning Ship

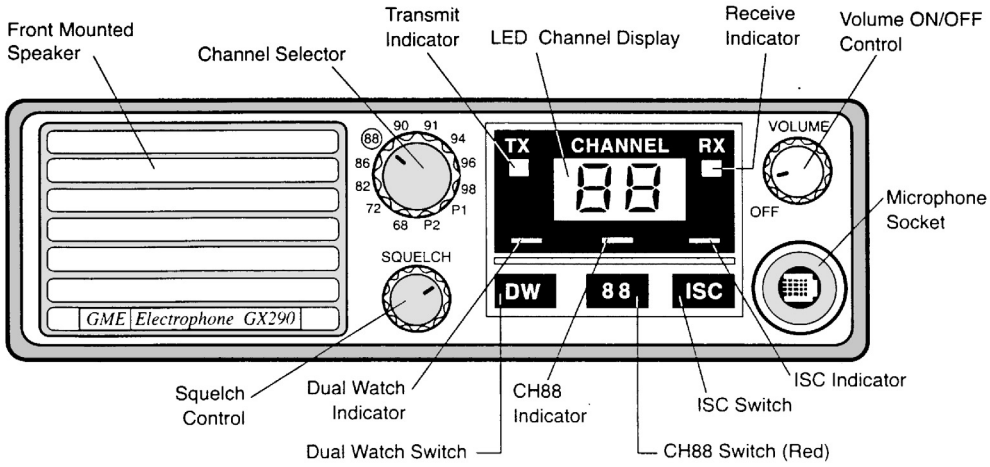
Q6. Explain why VHF sets are preferred over 27MHz sets.

They have a better coverage and less engine noise interference.

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

Poor or no reception, battery flat, out of range

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



WORKSHEET 26 ACTIVATE

SIGNALLING DEVICES

Read page 46, the information in the box opposite and answer the questions below.

EPIRBS

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

It is an emergency position indicating radio beacon.

It is activated only as a last resort when all other emergency forms of communication have been exhausted or when instructed to be used by a rescue organisation.

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

121.5

Q3. Identify the correct EPIRB to buy after 2009.

406 - they will be registered with AMSA and when activated can be checked against the user to prevent false searches.

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

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.

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.

Because it could go off and you will cause a search and rescue to be activated and maybe cop a fine.

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

The HexID or Unique Identity Number (UIN) is the unique code programmed into each 406 MHz distress beacon and transmitted when the beacon is activated. When registering a distress beacon, this code must be included on the registration form as it is the only code that links the individual distress beacon to the registration database.

Flares

Read page 44-47 and answer the questions below.

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

A fluorescent orange - red coloured sheet with a large black V printed in the middle.

Drape it over the canopy or bow to signal distress so that it can be seen from the air.

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

They fire a flare up into the air that comes slowly down with a parachute so they can be seen from a distance.

When you think someone will see them - eg. boats in the distance.

After you have tried the radio.

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

Read the instructions on the flares in the boat your are in. They usually have a striker pin which will ignite the flare.

See page 46.

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

Red at night

Orange during the 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.

Turn it over and bail it out if able.

Otherwise take people out of the water,

tow vessel to shore or away from traffic and anchor.

Carry an EPIRB, VHF radio, log on to VMR. leave a note

Carry water, bailing equipment, life jackets PFD 1

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

Get everyone into life jackets. Activate EPIRB or flares if you can see another boat. Send MAYDAY.

It is essential to stay with the boat unless there is an uncontrollable fire or the boat sinks.

If you are wearing a PFD1, you need to lean back on your head support to stop rolling face down.

- If you can find anything that floats, hang on to it and tread water.

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

The HELP (heat escape lessening posture) minimizes the heat loss from the head, sides of the chest and groin areas as shown in Figure 29.3.

If you entwine your legs as shown, heat loss can also be reduced.

Above all you need to maintain your spirits and conserve your energy.

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

- *If possible, remove the patient from the elements and into dry shelter.*
- *Remove any wet clothing and replace with warm, dry clothing or blankets.*
- *Warm the patient gradually to avoid the onset of dangerous heart rhythms.*
- *If the patient is able, encourage them to drink warm liquids, monitor the patient and seek medical help.*

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

Check to see if everyone is Ok - check for injuries

Check hull and if secure push boat off and motor away

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

Bail it out manually or with a bilge pump

See own State requirements

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

Arms waving up and down by side, gun shot at regular intervals,

SOS signal, radio Mayday, signal flags N over C.

flare, V sheet

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: _____

Depends where you live.

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.	*This situation reminds us to always have insurance up to date, lock car, take keys, lock spares, take valuables. Take a mobile phone. Call Police.*
b.	*Grab a towel, bandage and apply compression bandage to stop blood flow. Watch for shock. If near land dial 000 for ambulance or drive to hospital ASAP. Pressure and elevation. Cool if possible.*
c.	*Compression bandage from foot to thigh. Ring hospital to get antivene ready. Watch for shock. Get to hospital ASAP. Rest patient.*
d.	*Go home ASAP. ABC if required. Radio for ambulance to pick up at boat ramp if needed.*
e.	*Try to get it started. Radio for assistance, try to row to shore or anchor boat.*
f.	*Right it and bail it out. Call for assistance if cannot start engine. Stay with boat. Anchor to prevent drifting away.*
g.	*Advise to take travel sickness tablets before. Plan for shorter trip. Look at weather. Advise to have light meals before going.*
h.	*Have spare old clothes in waterproof bag and hat. Sunscreen in first aid kit.*
i.	*Fuel should be one third out, one third back and one third in reserve. Estimate fuel and decide if can or cannot go back*

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

Telephone them up. Advise by radio.

Say - Hi Honey I'm home (good luck)

Emergency planning

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

1. Check the weather and estimate expected conditions, Contact VMR - provide vessel details and passage plan

2. Check enough fuel and oil (1/3 there : 1/3 return : 1/3 reserve), Leave a note detailing passage plan

3. Check all safety gear is present, Check tool kit suitable for area of operation

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

1. Lack of maintenance 2. Contaminated fuel 3. Spark plugs/ignition wet

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

Get a weather forecast to decide to go or stay

Secure all gear, brief crew, check for safe anchorage, check fuel

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

Get wet weather gear ready . Wear non slip shoes for safety, find safe shore conditions (eg. boat ramp, jetty) to unload

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?

It is a boating safety obligation of the skipper to operate the boat in a safe manner.

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 Item	② Name	③ How to stow for ease of access	④ How to check if in good working order
1.	Marine radio	2, 9	Turn it on, check for corrosion
2.	Bailer and 5 m rope	6	Fill with water to see if leaks
3.	Anchor and chain	6	Check shackles for corrosion
4.	Signalling mirror	5	Check for cracks, corrosion
5.	Torch	5	Check batteries for corrosion
6.	V Sheet	5	Check seal on bag
7.	Life jacket	6a	Check for deterioration in materials
8.	Water bottles	6	Check to see if leaking. Refresh if stale.
9.	Hand compass	6	Check for deterioration in materials
10.	Flares	5	Check expiry dates
11.	Paddles (oars)	7	Check for deterioration of materials
12.	First aid kit	5	Check seal on bag/supplies if used
13	Chart	3, 8	Check seal on container
14.	EPIRB	5	Check for deterioration in materials
15.	Fire extinguisher	2, 6	Check service record current

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 32.1 V sheet on a disabled boat

Q1. Describe how would you help the family in the Figure 32.1?

Drive over and ask them if they need a tow.

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

It's better to stay well than get sick.

Q3. Describe how should you treat a coral cut.

Wash the cut thoroughly and inspect if any foreign materials are still in the wound.

A painful but practical way to remove small pieces of coral or grit is with a toothbrush.

Apply a drying antiseptic such as betadine (check of they are allergic first) and cover the wound with a sterile dressing.

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

- *Control the bleeding by pressure, elevation and rest*
- *Clear the area of skin around the laceration and apply a sterile dressing*
- *Those with broken skin should check their tetanus injection records*
- *Large cuts may require stitching - take to hospital*
- *Superficial foreign matter should be removed, but anything deep should be left to a doctor*

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

- *If possible, remove the patient from the elements and into dry shelter.*
- *Remove any wet clothing and replace with warm, dry clothing or blankets.*
- *Warm the patient gradually to avoid the onset of dangerous heart rhythms.*
- *If the patient is able, encourage them to drink warm liquids.*
- *Monitor the patient and seek medical help*

Q6. Describe the treatment for nontropical Bluebottle stings?

- *Place the victim's stung area in hot water (no hotter than the rescuer can comfortably tolerate)*
- *If the pain is unrelieved by the heat, or if hot water is not available, apply cold packs or wrapped ice*

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

- *Remove the patient from the water and restrain if necessary*
- *Call for help (dial 000)*
- *Assess the patient and commence CPR as necessary*
- *Liberally douse the stung area with vinegar to neutralise invisible stinging cells*

  - do not wash with fresh water
- *If vinegar is unavailable, pick off any remnants of the tentacles (this is not harmful to the rescuer) and rinse sting well with seawater (not freshwater)* • *Seek medical assistance with rapid transport to hospital*

Q8. See Yachting Australia handbook

WORKSHEET 30 HANDLE ADVERSE CONDITIONS

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

HEAD ON: Reduce speed.

Position crew towards stern to reduce green water coming

over bow but not so far as

to swamp the boat

SIDE ON: Steer a weaving course taking each wave

at an angle.

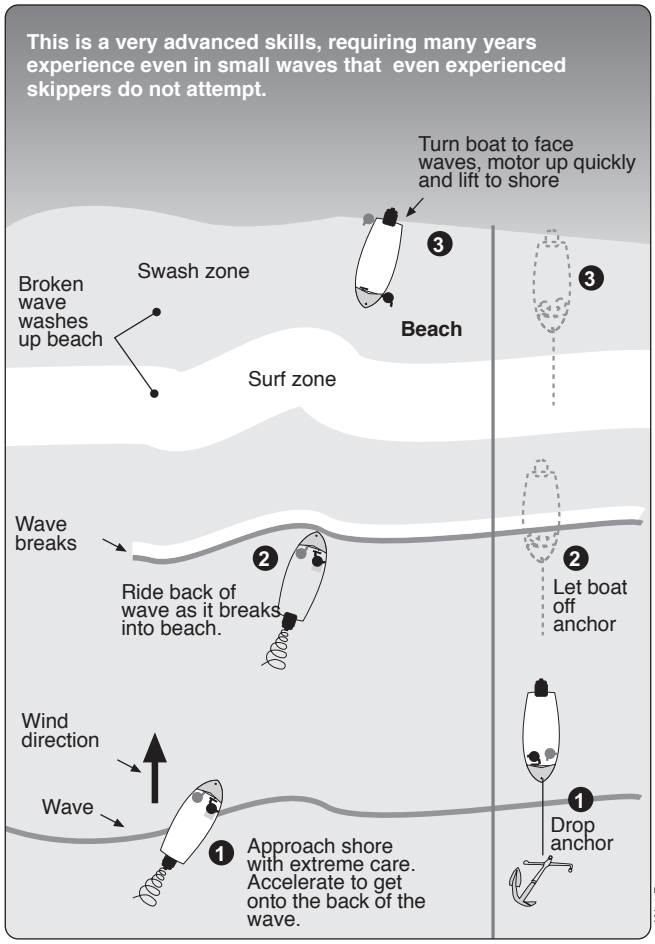
Avoid steep faces and waves about to break.

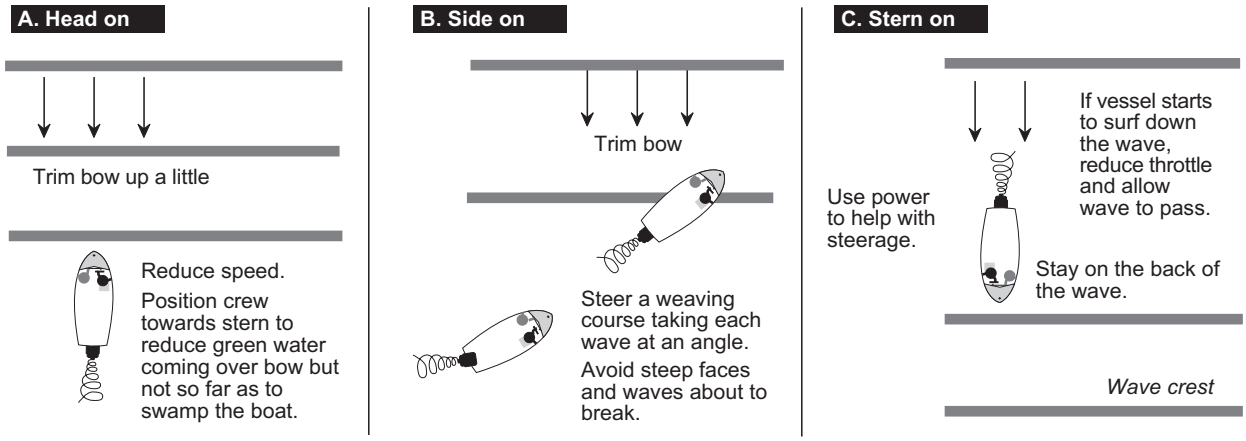
STERN ON: Use power to help with steerage.

Stay on the back of the wave. If vessel starts to surf

down the wave,

reduce throttle and allow wave to pass.





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