

KNOWLEDGE:

THE BOAT

1. Describe different types of boats including power-driven, jet-propelled, sailing, and human-propelled. Discuss characteristics and limitations of each boat type, including hull shape, displacement type, and boat's purpose.
2. Define and demonstrate knowledge of common nautical terms used across all types of boating, such as vessel, port, starboard, bow, stern, stand-on, and give-way.
3. Define and demonstrate knowledge of directions on and around the boat and in the nautical environment, including terms like fore, aft, ahead, astern, and abeam.
4. Describe how propulsion works on inboard, outboard, stern drive, and water-jet driven boats. Discuss characteristics and limitations of propulsion types.
5. Describe parts of propulsion systems, common and unique, to different types of propulsion.
6. Describe hull shapes commonly found on modern power boats, such as planing, deep v-hull, and flat bottom. Discuss characteristics and limitations of each hull shape.
7. Describe applicable laws and regulations related to titling, registering, and/or documentation of a recreational powerboat.
8. Describe how to find and follow recommended horsepower ratings and why compliance is important.
9. Describe proper procedures and safety concerns, including ventilation, when fueling a powerboat (gasoline and diesel).

EQUIPMENT

10. List USCG required equipment on a recreational powerboat of various lengths.
11. List state-specific equipment requirements where applicable.
12. Discuss additional American Boating recommended equipment, its use and practicality.
13. Discuss essential and additional personal equipment for both safety and utility.

KNOWLEDGE (CONTINUED):

BOAT OPERATOR (SKIPPER) AND CREW

14. Describe responsibilities of operator, crew, and passengers.
15. Describe procedures to become familiar with a boat's current condition and common points of failure that may interfere with its seaworthiness.
16. Explain the contents of pre-departure checklists for the boat, yourself (operator), and your crew and passengers.
17. Describe the purpose and content of a float plan, to whom it should be submitted, and when and how it should be canceled.
18. Describe how to locate weather information, and how to predict and identify and plan for weather conditions that could be dangerous, including strong winds, storms, lightning, hurricanes, and fog. Also describe various water conditions, including high water, sand bars, currents, large waves, tides, and their importance in trip planning.
19. Describe how to obtain information about local hazards and local knowledge that may affect the safe operation of a recreational boat, including the use of charts, whether or paper.
20. Describe characteristics of a small powerboat that might make it unstable during boarding, and how to board safely.
21. Determine a boat's capacity by locating and determining gross load capacity; describe how to calculate a boat's capacity; and describe proper gear stowage and its effect on stability and safety.
22. Describe common elements of a powerboat that affect safety, and basic maintenance procedures.

LEAVING THE DOCK OR MOORING

23. Describe engine pre-start and starting procedures for different types of powerboats, including the need for engine compartment ventilation. Also describe an engine/propulsion cut-off device and how to use it.
24. Describe and name lines used to secure a small powerboat to a dock or mooring.
25. Describe crew assignments, ways they can assist, and placement of crew and passengers.
26. Describe procedures for releasing lines, including the effects of wind and current and the proper sequence to account for wind and sea conditions.

KNOWLEDGE (CONTINUED):

OPERATING THE BOAT

27. Describe how throttle and shift affect a small powerboat's speed, direction, and performance. Also compare tiller and wheel steering configurations.
28. Describe a boat's pivot point and how it affects turning and safety.
29. Describe the effect planing has on the boat, its speed, and its maneuverability.
30. Describe how, when, and why water depths may vary, and describe how to determine water depths and how to safely operate in waters of varying depths.
31. Discuss various sources of water surface disturbances and how they might affect a small powerboat's passage through a body of water.
32. Describe types and characteristics of ATONS that operators of small powerboats are most likely to encounter. Also describe how this information will affect the safe course, speed, and operation of a small powerboat.
33. Describe typical navigation rule situations from the Navigation Rules and Regulations (International and Inland Rules of the Road), and the operator's legal obligations in Rules 2, 5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, and 19.
34. Describe required lights and sound signals for recreational boats.
35. Describe visual distress signals for recreational boaters, including different types and the required visual distress signals on recreational powerboats.
36. Describe responsibilities, impacts, and hazards created by boat wakes.
37. Describe carbon monoxide dangers, sources, symptoms, and avoidance practices.
38. Describe the dangers posed by powerboat propellers and procedures for avoiding contact with people in the water.
39. Describe dangers posed by operating a vessel under the influence of alcohol and/or drugs and potential penalties for violators.
40. Describe flags commonly used to alert boaters of divers in the water. Also describe how to safely operate a vessel in the vicinity of divers.
41. Describe various methods of courteous interactions with people onshore, operators of other vessels, and the importance of maintaining polite and safe behavior on the water. Also describe when and how a boater must, according to the law, provide assistance to another boat.
42. Describe different types of anchors used for small powerboats and the appropriate bottom characteristics for each anchor. Also describe a method of anchoring that will maximize holding power, including calculating anchor rode length.

KNOWLEDGE (CONTINUED):

SECURING THE BOAT

- 43. Describe how to safely bring a small powerboat to a dock or mooring.
- 44. Describe how to secure a small powerboat to a dock or mooring. Name the proper lines and their locations.
- 45. Describe how to safely transfer people, pets, and gear from a small powerboat to a dock, or dinghy and then to a dock.
- 46. Describe procedures for properly stowing gear on a small powerboat. Also use a post-voyage checklist to prepare to leave a powerboat for an extended time.

EMERGENCIES

- 47. Describe how to keep people safely inside the vessel to prevent accidental man overboard (MOB) situations, and also how to safely return to a person in the water and bring them back onto the boat.
- 48. Describe how to prevent, identify, and treat excess exposure to heat and to cold.
- 49. Describe and discuss common boating injuries and how to prevent and treat them.
- 50. Describe common sources of fire onboard a small powerboat, how to minimize the potential for fire, and how to extinguish a fire.
- 51. Identify potential sources of leaks on a small powerboat, how to prevent and repair leaks, and how to remove excess water from a boat.
- 52. Describe procedures for towing your vessel by another boat and using your boat to tow another vessel. Also describe the risk involved in potentially damaging either the towing boat or the towed boat.
- 53. Describe proper methods of communication with other vessels and emergency hailing over the VHF radio and by other means.
- 54. Describe how a boater should interact with law enforcement to ensure the experience produces the best possible outcome.
- 55. Describe when, how, and to whom a boater should report an accident.

KNOWLEDGE (CONTINUED):

ADDITIONAL BOATING CONSIDERATIONS

- 56. Describe how to keep people safely inside the vessel to prevent accidental man overboard (MOB) situations, and also how to safely return to a person in the water and bring them back onto the boat.
- 57. Describe risks unique to hunters and anglers while boating.
- 58. Describe how to be aware and comply with additional laws that may apply to your boat, your specific water activity, and in a particular location.

SKILLS:

THE BOAT

- 59. Use nautical terms while communicating, such as vessel, port, starboard, bow, stern, stand-on, and give-way.
- 60. Locate registration documents onboard, and ensure they are legal and up-to-date.
- 61. Locate maximum horsepower information onboard.
- 62. Determine whether the boat requires gasoline or diesel fuel, identify the fuel filler and its vent(s), and perform or simulate proper fueling procedures.

EQUIPMENT

- 63. Locate and inspect all USCG required equipment onboard, ensuring compliance of minimum required equipment, proper sizes and types of life jackets for everyone onboard, and practice and demonstrate how life jackets are worn.
- 64. Locate and inspect any additional, optional safety equipment.

BOAT OPERATOR (SKIPPER) AND CREW

- 65. Explain basic boat operation and safety concerns to crew and passengers.
- 66. Inspect the boat to determine its overall condition and seaworthiness.
- 67. Perform pre-departure checklists where applicable.
- 68. Acquire marine forecast(s) from reliable source(s) of local marine weather, and assess if a trip is prudent.
- 69. Locate sources of information about local hazards, and obtain local knowledge that may affect the planned trip.

SKILLS (CONTINUED):

BOARDING THE BOAT

- 70. Direct and assist crew and passengers aboard the boat.
- 71. Ensure all personal gear and boat equipment is properly stowed.

LEAVING THE DOCK OR MOORING

- 72. Follow recommended engine starting procedure, ensuring cooling water is exiting the engine if an exit point is visible above the waterline.
- 73. Cast off, maneuver safely away from dock or mooring, and remove and stow dock/mooring lines and fenders.

OPERATING THE BOAT

- 74. Test the throttle and shifter and steering controls at various speeds to start, stop, and turn the boat, meanwhile assessing adequate water depth and clearance in all directions. Observe all navigation rules and ATONS.
- 75. Perform various open water maneuvering exercises, including sharper turns at lower speeds, straight and curved lines in forward and reverse, using trim tabs and adjusting weight, and approaching floating objects from various wind directions.

RETURNING THE BOAT HOME

- 76. Perform good docking procedures, briefing crew and passengers on safety measures and their supportive roles prior to docking, approaching at a safe speed, and with various wind conditions.
- 77. Preset dock lines and fenders well before making contact with the dock, and plan and execute a sequential procedure of attaching lines to cleats, pilings, or other secure points of attachment as appropriate.
- 78. Organize gear and personal items for removal on deck or in the cockpit, and assist one another in disembarking and passing gear to the deck or dinghy.
- 79. Work through a post-voyage checklist that has been provided or created.

SKILLS (CONTINUED):

EMERGENCIES

80. Place a floating object to simulate Man Overboard in the water, and maneuver away from it, returning to the object and retrieving it, observing all safety considerations.
81. Tie each knot listed within 20 seconds: figure-8, square (reef), clove hitch, round turn & 2 half hitches, cleat hitch, and bowline.

AMERICAN BOATING 103 STANDARDS

INTERMEDIATE POWERBOATING

DESCRIPTION:

The following standards cover the knowledge and skills required for a boater to be able to skipper a power driven vessel of approximately 30 to 45 feet in length.

INTERMEDIATE Standards will instruct for the student to have knowledge and skills for single-day cruising, in light to moderate conditions, knowledge of provisioning, galley operations, boat systems, engine operation, routine maintenance procedures, docking, health & safety, emergency operations, weather interpretation, and dinghy/tender operation is required.

PREREQUISITES:

- AB 101 Beginner Powerboating Certification
- Ability to demonstrate competencies in all knowledge and skills elements of those Standards

RECOMMENDATIONS:

- AB recommends a minimum of 80 on-water operating hours to build skills and experience before undertaking AB 103 & 104.

STUDY MATERIALS:

- Advanced Powerboating textbook
- [USCG Navigation Rules & Regulations Handbook](#)

AMERICAN BOATING 103 STANDARDS

INTERMEDIATE POWERBOATING

KNOWLEDGE:

Will be tested through AB 103 Examination proctored by an AB certified Instructor

CRUISE PLANNING

1. Describe the symptoms and first aid treatments for hypothermia and heat exhaustion / heat stroke.
2. Describe the causes, prevention, and treatments for seasickness. Explain the contents of pre-departure checklists for the boat, yourself (operator), and your crew and passengers.

SYSTEMS

3. Describe safe galley procedures to minimize dangers such as fire, scalding, and spillage.
4. Describe proper marine toilet operation, including precautions to prevent clogging or malfunction, and describe proper holding tank pump-out procedures.
5. Identify and describe the function of the fundamental systems and components of a marine diesel engine, gasoline engine, and electric motor, including fuel, lubrication, cooling, and drive train.
 - 5.1 Describe safe battery charging procedures for an electric boat.
 - 5.2 Discuss the application, and pros and cons, of using electric propulsion in recreational boats.
6. Describe safe fresh water and fuel tank filling procedures, including identification of correct deck fills.
 - 6.1 Describe safe filling procedures for fuel tanks, including bilge ventilation
 - 6.2 Discuss how to verify that there are no fuel vapors in the engine compartment.

KNOWLEDGE (CONTINUED):

EMERGENCIES

7. Name four distress signals, per the USCG Navigation Rules and Regulations Handbook, which are appropriate for a recreational vessel.
8. Describe actions to be taken in the following situations:
 - 8.1 Collision with another boat
 - 8.2 Running aground
 - 8.3 Dragging Anchor
 - 8.4 Flooding
 - 8.5 Fire
9. Describe actions to be taken in the following situations when the vessel is under way:
 - 9.1 Fouled Propeller
 - 9.2 Engine cooling water fails to flow
 - 9.3 Engine fails in a crowded anchorage
 - 9.4 Engine fails in a busy channel
 - 9.5 Loss of steering system in twin engine vessel

SEAMANSHIP

10. Describe, using diagrams as appropriate, the applicable rules (avoiding collisions, using lights and sound signals, etc.) for a 30' to 45' recreational power vessel, as found in the USCG Navigation Rules and Regulations Handbook.

NAVIGATION & WEATHER

11. Describe actions to be taken in the following weather situations:
 - 11.1 Fog / reduced visibility
 - 11.2 Squall / thunderstorm
 - 11.3 Extremely large waves / rough sea state

AMERICAN BOATING 103 STANDARDS

INTERMEDIATE POWERBOATING

SKILLS:

Will be demonstrated and practiced onboard for an AB certified instructor

GENERAL

12. Locate and check the condition of all federally and state required equipment.

SYSTEMS

13. Perform a routine vessel inspection, ensuring that all systems and equipment are in working order, including:
- 13.1 Fuel level and system
 - 13.2 Fresh water level and system
 - 13.3 Battery voltage and charging system
 - 13.4 Electrical system
 - 13.5 Navigation lights and interior lights
 - 13.6 Instruments and electronics
 - 13.7 Bilge pumps
 - 13.8 Through-hulls and seacocks
 - 13.9 Deck hardware including windlass
 - 13.10 Anchor and rode
 - 13.11 Genset
14. Visually inspect the engine (s). Check for correct engine oil level, transmission oil and potential problems such as leaking fluids or frayed belts; demonstrate safe engine starting, operating, and stopping procedures.
15. Inspect the raw water strainer for debris, remove any present, and ensure that the raw water intake seacock is in the proper position for engine operation.
- 15.1 Explain the difference between gate valves and ball valves, and close and open each type
 - 15.2 Explain why hose connections should have double hose clamps
 - 15.3 Demonstrate how to tighten clamps for leaking hose
16. Locate the emergency steering tiller (if equipped) and identify how it attaches to the rudder post.
17. Operate the electric and manual bilge pumps to ensure they are functional.
- 17.1 Locate the bilge pump float switches and verify that they are not jammed or obstructed

SKILLS (CONTINUED):

SYSTEMS (CONTINUED)

- 18. Demonstrate proper usage of the VHF radio, including hailing another station on Channel 16 and switching to a working channel.
 - 18.1 Simulate a call using the preliminary phrases Securite, Pan Pan and Mayday, and explain what each means
 - 18.2 Identify the DSC distress button on the radio and explain how it works
- 19. Demonstrate proper operation of the galley stove including fuel supply, lighting, and shutting down; simulate the proper way to extinguish a galley fire.
- 20. Demonstrate the proper method of disconnecting and reconnecting shore power cables.
 - 20.1 Simulate the correct method of switching from internal power to shore power
 - 20.2 Explain the function of an inverter and demonstrate if so equipped

UNDERWAY IN CLOSE QUARTERS

- 21. Demonstrate the use of spring lines in the docking/undocking process (e.g., pivoting the vessel away from the dock during departure).
- 22. Maneuver the vessel in Reverse gear, observing and explaining the effect of prop walk on the boat's motion.
- 23. Perform a "standing turn" maneuver, turning the vessel 180-degrees in a confined area using rudder position and gearshift / throttle control. Explain or demonstrate the use of twin engines, bow thruster, or steerable propulsion in this maneuver.
- 24. Ensure vessel / crew readiness and use the engine(s) to bring the vessel smoothly and under control to a stop next to a parallel dock or into a slip; secure the vessel using appropriate lines and fenders.
- 25. Describe/demonstrate an appropriate person in water (a.k.a. Man Overboard or MOB) recovery maneuver while under power and describe methods to bring the MOB safely back aboard.

SKILLS (CONTINUED):

UNDERWAY IN OPEN WATERS

- 26. Using throttle, trim tabs, tachometer, and speedometer, and if necessary, redistributing the load, trim the vessel for its most economical and comfortable speed for conditions.
- 27. At cruising speed, turn the boat 45 degrees to either side of the base course and resume the base course.
- 28. Conduct an emergency stop from cruising speed, turning to ensure that the wake does not overtake the stern. Warn passengers and crew before commencing and resume base course after completion.
- 29. Cross waves or wakes at an appropriate angle and speed.
- 30. Maintain proper lookout at all times.

NAVIGATION & WEATHER

- 31. Use a GPS / chartplotter (if available) to obtain information and perform basic navigation functions such as position, course, speed, waypoints, ETA, and tidal information.
- 32. Pilot a boat into an unfamiliar harbor or anchorage by day using relevant nautical charts, publications, and tidal information.

KNOTS

- 33. Describe the purpose of and construct each of the following knots (without assistance and in a timely manner):
 - 33.1 Figure-8 Knot
 - 33.2 Square (Reef) Knot
 - 33.3 Clove Hitch
 - 33.4 Round Turn & 2 Half Hitches
 - 33.5 Cleat Hitch
 - 33.6 Bowline

NAVIGATION

1. Seamanship Knowledge

- **Charts and Publications**
 - *Coast Pilot 7* by NOAA (National Oceanic Atmospheric Administration)
 - Notice to Mariners
 - *Light List* by USCG https://navcen.uscg.gov/pdf/lightLists/LightList_V6_2019.pdf
 - Chart One
- **Tides and Currents**
 - Tide Tables
 - Current Tables
 - Canadian Current Atlas
 - Annual Current Tables
 - Ports and Passes
- **Aids to Navigation**
 - Buoys
 - Day Marks
 - Ranges
 - Information and Regulatory Markers
 - Lights
- **Cruising Guides**
 - Waggoner Cruising Guide
 - Blue Latitude Press Cruising Guides
 - San Juan Islands
 - Gulf Islands
- **Weather**
 - NOAA & Canadian weather radio (WX channels)
 - NOAA OPC
 - Internet APPs, Windy, Wunderground, etc.
- **Marlinspike Seamanship- common knots used on a boat:**
 - Cleat Hitch
 - Bowline
 - Round Turn and two half hitches
 - Clove Hitch
 - Figure 8 (stopper)

2. Navigation

- **Latitude & Longitude**
- **North and its Variations**
 - True North
 - Variation
 - Magnetic
 - Deviation
 - Compass
 - (TVMDCAW: *True Virgins Make Dull Company at Weddings*)
- **Charting Tools**

- Parallel Rules
- Dividers
- Pencil
- Calculator
- **Piloting**
 - Chart Datum
 - Compass Rose
 - Variation
 - Abbreviations and symbols- Chart One
 - Laying a course using Magnetic Rose
 - Distance Using Latitude (one nautical mile = one minute of latitude)
 - Dead Reckoning
 - Running Fix
 - Address of 60D ST $60 \times \text{Distance} = \text{Speed} \times \text{Time}$

3. Electronic Piloting: Chart Plotter & Radar

- **What a chart plotter offers:**
 - Ensure a "Fix" is acquired
 - Find function to "Find Ship"
 - Range in and range out
 - Move Cursor around the screen
 - Use "Go To" function for single waypoint
 - Set up "Data" boxes
 - COG (course over ground)
 - SOG (speed over ground)
 - Vessel position latitude and longitude
 - Split screen (radar, sonar, chart plotter)
 - Brightness control
 - Sea talk capability with speed/depth/auto pilot
- **Radar: *Start-up***
 - Turn on scanner
 - Warm up time needed
 - Standby to transmit (TX)
 - Adjust gain manually
 - Adjust rain mode manually
 - Adjust turning manually
 - Harbor/offshore mode
- **Radar: *Using***
 - Range in and range out
 - EBL (electronic bearing line)
 - VRM (variable range marker)
 - Target tracking
- **Navionics APP**

4. Rules of the Road (COLREGS- *International Maritime Organization*)

- Rule #2- Responsibility
- Rule #5- Look out Rule
- Rule #6- Safe Speed
- Rule #7- Risk of Collision
- Rule #9- Narrow Channels
- Rule #13- Overtaking
- Rule #14- Head on Situation
- Rule #15- Crossing Situations
- Rule #16- Give Way Vessels
- Rule #17- Stand-on Vessels
- Rule #18- Pecking Order
 - Not under command
 - Restricted by ability to maneuver
 - Constrained by draft
 - Fishing Vessels
 - Sailboats
 - Powerboats
 - Seamplanes
- Rules #21 thru 35- Lights and Shapes
- Rules#27e- Driver's Flags
 - Alpha flag
 - Diver down flag
- Rule #34- Maneuvering Sound Signals
 - Short blast (1 second)
 - Prolonged blast (4-6 seconds)
 - Once short blast- altering course to starboard
 - Two short blasts- altering course to port
 - Three blasts- operating astern propulsion (in reverse)
 - Five blasts- danger signal
- Rule #35- Sound Signals in Reduced Visibility
 - Every two minutes
 - Power vessels
 - -- Under way
 - -- -- Not under way
 - Sailing vessels _ . .
 - Tug and Tow _ . . .
- Rule #37- Signals to Attract Attention (Distress Signals)

5. Safety and Emergency Procedures

- Nine Items the Coast Guard Requires
 1. Type 1,2,3 or 5 PFDs (Personal Flotation Device)
 2. Type 4 throwable device
 3. Fire extinguishers (usually 3 type BC)
 4. Daytime distress signals (smoke)
 5. Nighttime distress signals (aerial or red roman candle type)
 6. Navigation lights

7. Registration or Documentation
8. Sound making device (air horn)
9. Marine sanitation device

- **VHF Procedures**

- Use channel 16 for hailing other stations
 - ***"May Day"*** Life threatening emergency
 - ***"Pan Pan"*** Non-life threatening emergency
 - ***"Securite"*** Informational Call (i.e. Deadhead, navigation hazard)
 - Hail other station three times and give your boat name twice.
 - Switch to **"working channel"** to continue conversation
- Other important channels
 - Working channels
 - Vessel Traffic
 - Bridge to bridge
 - Weather channels 2 & 3 Canada, 4 is NOAA (WX function)
- Practice skills
 - Negotiate passage with another vessel

- **Float Plan**

- Don't file with Coast Guard
- File with Friends, family or charter company



U.S. AIDS TO NAVIGATION SYSTEM on navigable waters except Western Rivers

LATERAL SYSTEM AS SEEN ENTERING FROM SEAWARD

PORT SIDE ODD NUMBERED AIDS	PREFERRED CHANNEL NO NUMBERS-MAY BE LETTERED	PREFERRED CHANNEL NO NUMBERS-MAY BE LETTERED	STARBOARD SIDE EVEN NUMBERED AIDS
<p>GREEN LIGHT ONLY</p> <p>FLASHING (Q) </p> <p>FLASHING (G) </p> <p>OCULATING </p> <p>GROUP FLASHING (G) </p>	<p>PREFERRED CHANNEL TO STARBOARD (TOPCAST) MARK</p> <p>GREEN LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (G+V) </p>	<p>PREFERRED CHANNEL TO PORT (TOPCAST) MARK</p> <p>RED LIGHT ONLY</p> <p>COMPOSITE GROUP FLASHING (G+V) </p>	<p>RED LIGHT ONLY</p> <p>FLASHING (Q) </p> <p>FLASHING (R) </p> <p>OCULATING </p> <p>GROUP FLASHING (R) </p>
<p>1</p> <p>LIGHT </p> <p>1" R G B</p> <p>3</p> <p>LIGHTED BUOY </p> <p>3" R G B</p>	<p>U</p> <p>LIGHT </p> <p>U" R G B</p> <p>S</p> <p>LIGHTED BUOY </p> <p>S" R G B</p>	<p>8</p> <p>LIGHT </p> <p>8" R G B</p> <p>6</p> <p>LIGHTED BUOY </p> <p>6" R G B</p>	<p>2</p> <p>LIGHT </p> <p>2" R G B</p> <p>4</p> <p>LIGHTED BUOY </p> <p>4" R G B</p>
<p>5</p> <p>LIGHT </p> <p>5" R G B</p> <p>7</p> <p>LIGHTED BUOY </p> <p>7" R G B</p>	<p>W</p> <p>LIGHT </p> <p>W" R G B</p> <p>X</p> <p>LIGHTED BUOY </p> <p>X" R G B</p>	<p>9</p> <p>LIGHT </p> <p>9" R G B</p> <p>7</p> <p>LIGHTED BUOY </p> <p>7" R G B</p>	<p>10</p> <p>LIGHT </p> <p>10" R G B</p> <p>12</p> <p>LIGHTED BUOY </p> <p>12" R G B</p>

AIDS TO NAVIGATION HAVING NO LATERAL SIGNIFICANCE

<p>ISOLATED DANGER NO NUMBERS-MAY BE LETTERED</p> <p>WHITE LIGHT ONLY</p> <p>FLASHING (W) </p> <p>FLASHING (I) </p> <p>OCULATING </p> <p>GROUP FLASHING (W) </p>	<p>SAFE WATER NO NUMBERS-MAY BE LETTERED</p> <p>WHITE LIGHT ONLY</p> <p>FLASHING (W) </p> <p>FLASHING (I) </p> <p>OCULATING </p> <p>GROUP FLASHING (W) </p>
<p>DAYBOARDS-MAY BE LETTERED</p> <p>WHITE LIGHT ONLY</p> <p>DAYBOARD (A) </p> <p>DAYBOARD (B) </p> <p>DAYBOARD (C) </p>	<p>RANGE DAYBOARDS-MAY BE LETTERED</p> <p>DAYBOARD (A) </p> <p>DAYBOARD (B) </p> <p>DAYBOARD (C) </p>
<p>TYPICAL INFORMATION AND REGULATORY MARKS</p> <p>INFORMATION AND REGULATORY MARKS WHICH MAY BE USED FOR INFORMATION AND REGULATORY PURPOSES ONLY EXCEPT GROUP FLASHING AND FLASHING (Q)</p> <p>WHITE LIGHT ONLY</p> <p>DAYBOARD (A) </p> <p>DAYBOARD (B) </p> <p>DAYBOARD (C) </p>	<p>SPECIAL MARKS-MAY BE LETTERED</p> <p>YELLOW LIGHT ONLY</p> <p>FLASHING (Y) </p> <p>FLASHING (I) </p> <p>OCULATING </p> <p>GROUP FLASHING (Y) </p>

Aids to navigation marking the Intercoastal Waterway (ICW) display unique yellow symbols to distinguish them from aids marking other waters. Yellow triangles indicate aids should be passed by keeping them on the starboard (right) hand of the vessel. Yellow squares indicate aids should be passed by keeping them on the port (left) hand of the vessel. A yellow horizontal band provides no lateral information, but simply identifies aids as marking the ICW.

Calculating Speed Distance, Speed and/or Time

Distance is measured in Nautical Miles
Speed is measured in **Knots** (Nautical Miles per Hour)
Time is in Hours and Minutes

Method #1 Using Minutes

$$\frac{60 \times D}{S \times T}$$

$$\text{Distance} = \frac{\text{Speed} \times \text{Time}}{60}$$

If you travel at 3 knots for 1½ hours you will travel a distance of 4.5 nautical miles

$$D = \frac{3 \times 90}{60} \quad (1.5 \text{ hours} = 90 \text{ minutes})$$

$$D = 4.5 \text{ nautical miles}$$

$$\text{Speed} = \frac{60 \times \text{Distance}}{\text{Time}}$$

If you travel 4.5 nautical miles in 90 minutes your speed is 3 Knots

$$S = \frac{60 \times 4.5}{90}$$

$$\text{Time} = \frac{60 \times \text{Distance}}{\text{Speed}}$$

If you cover 4.5 nautical miles at 3 knots and it will take you 90 Minutes

$$T = \frac{60 \times 4.5}{3}$$

$$T = 90 \text{ minutes}$$

Method #2 Using Hours

$$\frac{\text{Distance}}{\text{Speed} \times \text{Time}}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

If you travel at 3 knots for 1½ hours you will travel a distance of 4.5 nautical miles

$$D = 3 \times 1.5$$

$$D = 4.5$$

$$\text{Speed} = \text{Distance} / \text{Time}$$

If you travel 4.5 nautical miles in 1.5 Hours your speed is 3 Knots

$$S = 4.5 / 1.5$$

$$S = 3$$

$$\text{Time} = \text{Distance} / \text{Speed}$$

If you cover 4.5 nautical miles at 3 knots and it will take you 1.5 hours

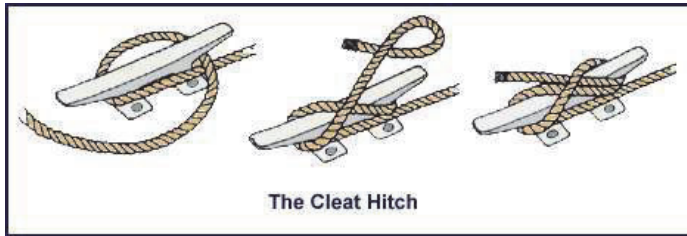
$$T = 4.5 / 3$$

$$T = 1.5$$

If you need time in minutes multiply time by 60 . . . $1.5 \times 60 = 90 \text{ minutes}$

Boat knots

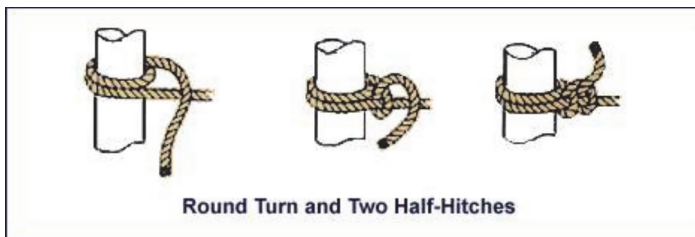
Cleat Hitch:



Bowline:



Round Turn & 2 Half Hitches:



Clove Hitch:



Square Knot:

