



Sailing Thumb Rules



Al Ponessa
Rick Izard



- Goals
 - To review some useful “Thumb Rules”
 - To explain them in terms to help us better understand and remember them
 - To get us thinking about what we can use to develop other Thumb Rules
 - To provide a hand-out with the rules
 - To make us better mariners



- Distance
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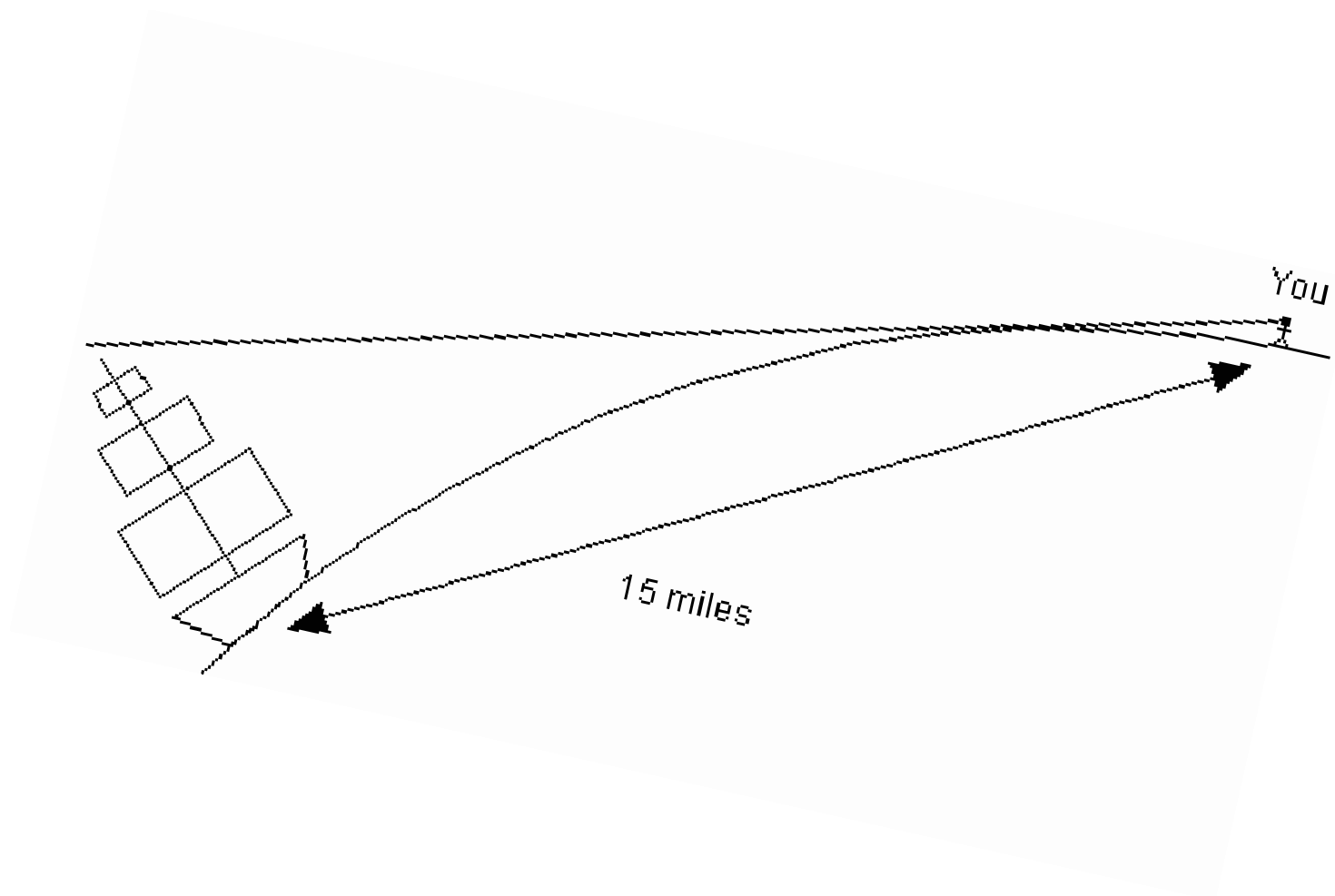
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– Combine Heights for Distance to an object when it first appears above the Horizon

You are 9 ft & Light is 100 ft, you will 1st see it at

$$1.13 \times (3 + 10) = 14.7 \text{ nm}$$





- Speed...Time...Distance
 - Speed – nm/hr (knots) (NOT knots/hr)
 - Time – hr
 - Distance – nautical miles (nm)
- Speed X Time = Distance
 - 6 knots X 2.5 hr = 15 nm
- Distance/Speed = Time
 - 25 nm/5 knots = 5 hr
- Distance/Time = Speed
 - 12 nm/3 hr = 4 knots (nm/hr)



- Six Minute Rule
 - 6 minutes = $1/10$ hour
 - If going 8 kts, in 6 min you go 0.8 nm
 - In 12 min you travel 1.6 nm
 - Distance traveled in 18 minutes?
 - $0.8 \text{ nm} \times 3 = 2.4 \text{ nm}$



- Three Minute Rule
 - Dist in *yards* = Speed X100
 - at 8 kts, you go 800 *yds* in 3 min
- One Minute Rule
 - Dist in *feet* = Speed X 100
 - at 8 kts, you go 800 *ft* in 1 min



- Speed through Water using a “Chip” or anything that floats (and fish can eat)

D is Distance in feet that object travels

$$\text{Speed} = \frac{0.6 \times D \text{ (ft)}}{\# \text{ of Seconds}}$$

So if you drop a chip and it travels 40ft in 10sec

Your speed is $\frac{(.6)(40)}{10} = 0.6 \times 4 = \text{nm/hr}$ or 2.4 kts

- 5 sec? = 4.8 kts
- 20 sec? = 1.4 kts
- 15 sec? = ~2 kts



- Maximum Theoretical Hull Speed for a Displacement Hull (i.e. not Planing)

$$\text{Max Speed} = 1.34\sqrt{\text{LWL}}$$

So...for a 36 ft LWL (~40' boat), the Max Speed is

$$1.34 \times 6 = \sim 8 \text{ kts}$$



- “Hand” Rules
 - 1 Finger at arms length = $\sim 2^\circ$
 - 1 Hand at arms length = $\sim 20^\circ$
 - If Sun is 4 Horizontal Fingers above the Horizon, Sunset is about 1 hour away...2 fingers is about $\frac{1}{2}$ hour away...2 hands, 2 hrs away (or just look it up on your Phone App!)
 - On an 80,000:1 Chart, a Thumb Width = 1 nm ...so on a 20,000:1 Chart , Thumb = $\frac{1}{4}$ nm

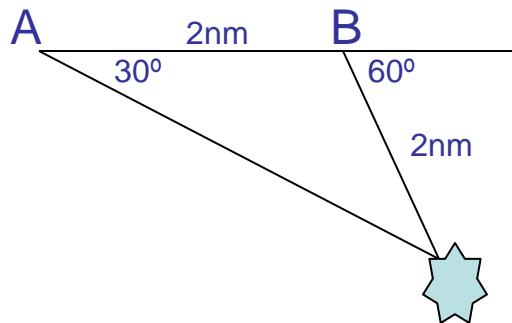


- Distance to Objects
 - At night you can see buoy lights at 2 – 3 nm
 - You can see a buoy at about 2 nm
 - You can tell what color it is at 1 nm
 - You can see windows on a house at ~ 2 nm
 - You can see individual trees at ~ 1 nm
 - You can see a person walking at ~1/2 nm
 - You can see his/her face at ~250yds



- Doubling the Angle of an Object
- Distance traveled = Distance to Object

If an object has a 30° Rel Brng (A) and after you travel 2 nm it has a 60° Rel Brng, (B) it is 2 nm away from you



Remember Isosceles Triangles from HS



- Doubling the Angle of an Object

Example:

- Object 30° Rel Brng to object at 10:00AM
 - Course and speed steady (example: 4 knots)
 - Record 10:00AM and 4 kts
- Object 60° Rel Brng to object at 10:15AM
 - Record 15 min.
- Distance traveled? = 1 nm
- Distance from object? = 1 nm



- Navigation Rules and Lights
 - “Red...Right...Returning”
 - EVEN Red Nuns have ODD Green Cans
 - Red over Green, Sailing Machine (optional)
 - Red over White, Fishing at Night
 - Green over White, Trawling at Night
 - White over Red, Pilot Ahead
 - Red over Red, Captain is Dead (NUC*)

*Not Under Command which means inability to maneuver = STAY AWAY



- Collision Avoidance Rule
 - CBDR* = Collision
 - If relative Bearing doesn't change and range is decreasing, MANEUVER Early and Large
 - Observe stationary object behind approaching vessel, or...
 - Line up vessel with Stanchion, Shroud, Bow Pulpit, etc.
 - Keep eyes in same position

*Constant Bearing, Decreasing Range



- Collision Avoidance Rule
 - CBDR* = Collision
 - If relative Bearing doesn't change and range is decreasing, MANEUVER Early and Large
 - Change heading and/or speed
 - Change in heading communicates more clearly to other vessel

*Constant Bearing, Decreasing Range



- Tides

- Rule of 12s'

- 1st Hr = 1/12 of total Range of Tide
 - 2nd Hr = 2/12 of total Range of Tide
 - 3rd Hr = 3/12 of total Range of Tide
 - 4th Hr = 3/12 of total Range of Tide
 - 5th Hr = 2/12 of total Range of Tide
 - 6th Hr = 1/12 of total Range of Tide

It all adds up to 12/12



- Tides Rule of '12s'
 - Example: Assume 12 foot tidal range, 6 hours duration
 - 1st Hr = 1' above low tide (1/12 of tidal range)
 - 2nd Hr = 3' above low tide (3/12)
 - 3rd Hr = 6' above low tide (6/12)
 - 4th Hr = 9' above low tide (9/12)
 - 5th Hr = 11' above low tide (11/12)
 - 6th Hr = 12' above low tide (12/12)



- Red Sky at Night, Sailor's Delight
 - Based on Sunset seen through dust particles from approaching High Pressure from the West
- Red Sky in the Morning, Sailor take Warning
 - Based on Sunrise seen through water vapor or dust from a passing High with a Low on the way from the West = RAIN



- Anchor Holding Power
 - 4:1 Scope* = 55%
 - 6:1 Scope = 70%
 - 8:1 Scope = 80%
 - 10:1 Scope = 85%
 - Infinite Scope (Horizontal Rode) = 100%
- Practically speaking 85% is about as good as it gets...but 10:1 make a large swing radius

*Scope based on water depth at high tide + freeboard at bow



- 1 Minute of Latitude = 1 nm = 2000yds = 6000 ft
- Distance to Horizon = $1.13 \sqrt{\text{Height of Eye (ft)}}$
- **Speed (kts) X Time (hr) = Distance (nm)**
- 6-minute Rule: Distance travelled in 6 min = Speed (in kts) \div 10
- Speed through the water in kts = (.6) X (Dist 'chip' moves)/# of Seconds
- Max Hull Speed in kts = $1.34 \sqrt{\text{LWL (ft)}}$
- Hand (spread) at arm's length = $\sim 20^\circ$; a finger is $\sim 2^\circ$
- You can see a buoy ~ 2 nm; distinguish color ~ 1 nm; see windows ~ 2 nm; trees ~ 1 nm
- If relative bearing of an object doubles, the distance to the object = distance traveled during the 'doubling'
- **RED...RIGHT...RETURNING**
- Even **RED** Nuns have Odd **GREEN** Cans
- CBDR = Collision...maneuver early and make it noticeable if risk of collision
- Rule of 12s for tides...change is 1/12 1st hr, 2/12 2nd hr, 3/12 3rd hr, etc.
- Red Sky at Night, Sailor's Delight...Red Sky in the Morning, Sailor take Warning
- Anchor Holding Power: 4:1 = 55%; 6:1 = 70%; 8:1 = 80%; 10:1 = 85%



- You notice a house on the beach that is 1 hand width off the bow. You are going 6 kts. In 20 min, the house is now 2 hand widths off the bow. How far away is the house?
- Speed X Time = Distance...6 kts X 1/3 hr = 2 nm. The relative bearing doubled while you were going 2 nm; therefore, the house is 2 nm away or 4000 yds.
- You have to be at a mooring that is 15 nm away. You can only make 4 kts on average. How long to get there? What speed would you have to make to get there in 3 hrs
- Distance ÷ Speed = Time $15 \text{ nm} \div 4\text{kts} = 3.75 \text{ hrs}$ or 3 hrs and 45 minutes
- Distance ÷ Time = Speed $15 \text{ nm} \div 3 \text{ hrs} = 5 \text{ kts}$

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