

# ***Boston Sailing Center***

## **Coastal Navigation**

### **Extra Problem Set Answers**

1. I would aim for R "2" BELL south and a bit east of West Island.  
221°T 236°M
2. Deviation on a Heading of 193°C is closest to 2° East. If the compass had no deviation it would point 2° further west, so the actual heading is 195°M.
3. COG = 007° + 180° = 187°M  
Leeway = 195°M - 187°M = 8°
4. Plot the COG from above and measure 2.5 nm from the starting buoy.  
41° 38.5' N 070° 40.3' W
5. Heading of 195°M on starboard + 90° tack = Heading of 285°M on port + 8° leeway = COG of 293°M.  
Deviation at Heading 285°M is 3° East. The steering compass should read 282°C.
6. The three bearings form a triangle slightly larger than you might like, but the EP falls inside that triangle and it wouldn't shift much if moved to the center.  
So something near 41° 38.7 N / 070° 43.8 W.
7. A bearing of 272°M on R N "2A" marking West Island Ledge works well.  
If you maintain a bearing >= that you will be in safe water.
8. From Eldridge p. 24 we learn that at Dumpling Rocks:  
Ebb starts 2h 30mins before Woods Hole  
The Set of the Ebb is 190°T  
The Max Velocity of the Ebb on average is 1.1 kts  
Also from Eldridge, we see that on July 14:  
2:48 pm Ebb starts at Woods Hole, so. . .  
12:15 pm Ebb starts at Dumpling Rocks  
3:15 pm is about Max Ebb at Dumpling Rocks  
Sailing this leg between 3:00 and 3:30 will give us Max Ebb  
Afternoon High Water at Boston is 9.5 ft  
Rule of Thumb: Bottom of page 41  
For the current speed on this tide we subtract 25% from max  
Our current speed on the 14th is 1.1 \* .75 = 0.8 kts  
A half-hour Current Vector will have a direction of 190°T and a length of 0.4 nm

9. Plot the current vector found above from the Mosher Ledge buoy.  
Set your dividers to 2 nm (one half hour of boat speed).  
Measure from the end of the current vector back to the line between the buoys.  
Plot the line connecting the points of your dividers. That's the heading to steer.  
I get  $301^{\circ}\text{M}$  minus Deviation of  $2^{\circ}\text{E} = 299^{\circ}\text{C}$ .
  
10. About a Foot:  
Eldridge p. 15 (mid page)  
    South Dartmouth 30 mins after Newport  
    Average rise 3.7 feet at S. Dartmouth  
Eldridge p. 87 July 14th at Newport  
    High at 11:45 am then Low at 5:00 pm  
    Height of 3.5 is average  
    High at Padanaram at 12:15. Low at 5:30.  
Arrival at Padanaram approximately 4:00 pm (4 nm from Mosher Ledge at 4 kts)  
Divide the 5 hours 15 minutes from High to Low into 6 intervals of 53 minutes each  
Divide the total change in height of 3.7 feet into twelfths, each of 3.7 inches.  
Our arrival at 4:00 is 3 hrs 45 mins after High, very close to 4 of our 6 time intervals  
The tide will have dropped  $1+2+3+3 = 9/12$  of the total.  $3/12$  of the rise remains  
Which for a Rule of Twelfths question means the answer is 'About a Foot'