

Tide Question - Answers

Per the instructions, calculate the range between the relevant high and low tides then lay out the time/height table using 1/12, 3/12, and 6/12. Then relate this to the datum.

Oh – wait – the latitude is 38 deg 20' north – hmmm - northern hemisphere - decent assumption that daylight savings are on. Add 1 hour to the tide tables.

- (1) 0800, 1015, and 12:30 are morning DST times after the first high tide.
Also a (-2) means that the low tide is 2 ft below the average.

Calculate the Range of the tide change = $12.3 + 2 = 14.3$

Range = 14.3 ft

1/12 = 1.2 ft

3/12 = 3.5 ft

6/12 = 7.15 ft

Time from table	Time DST	Closest Tide H/L	Twelfths	Twelfths Of range	Tide Height	Datum Z	Water Height
0600	0700	12.3	0	0	12.3	15	27.3
0700	0800	12.3	1/12	1.2	11.1	15	26.1
0800	0900	12.3	3/12	3.6	8.7	15	23.7
0900	1000	12.3	6/12	7.15	5.15	15	20.15
0930	1030	(-2)	6/12	7.15	5.15	15	20.15
1030	1130	(-2)	3/12	3.6	1.6	15	16.6
1130	1230	(-2)	1/12	1.2	(-0.8)	15	14.2
1230	1330	(-2)	0	0	(-2)	15	13

Q: What is the water depth at point Z at 0800, 1015, 1230

ANS:

0800 = 26.1 ft deep

1015 = 20.15 ft deep

1230 = 14.2 ft deep

(2) The Depth over the sand bar at 1600 (4pm). Notice liberal rounding down.

Range is 2 plus 11.5 = 13.5 ft

Range = 13.5

1/12 = 1.125

3/12 = 3.375

6/12 = 6.75

Time from table	Time DST	Closest Tide H/L	Twelfths	Twelfths	Tide Height	Datum Sandbar	Water depth
1230	1330	-2	0	0	-2	3	1
1330	1430	-2	1/12	1.125	-.9	3	2.1
1430	1530	-2	3/12	3.375	1.3	3	4.3
1530	1630	-2	6/12	6.75	4.7	3	7.7
1536	1636	11.5	6/12	6.75	4.7	3	7.7
1636	1736	11.5	3/12	3.375	8.1	3	11.1
1736	1836	11.5	1/12	1.125	10.4	3	13.4
1836	1936	11.5	0	0	11.5	3	14.5

At 1530 the depth is 4.375. At 1630 the depth is 7.7.

At or near mid-tide, it is acceptable to do a linear interpolation because the rising tide line is straight enough between adjacent hours. Thus the height at 1600 would be half way between 1530 and 1630 – or $(4.3+7.7)/2 = 6$ ft

Water depth at 1600 = 6 ft

(3) What is the earliest time in the afternoon the Skipper could cross the sandbar to the harbor given that the Skipper would like some safety depth under the keel?

Complete the Boat Draw and Safety situations below

A) Boat Draw = 4.5 ft Safety=2 ft

This means when is the water depth 6.5 ft

B) Boat Draw= 4.0 ft Safety=1.0 ft

This means when is the water depth 5.0 ft

C) Boat Draw = 4.5 ft Safety=2.5 ft

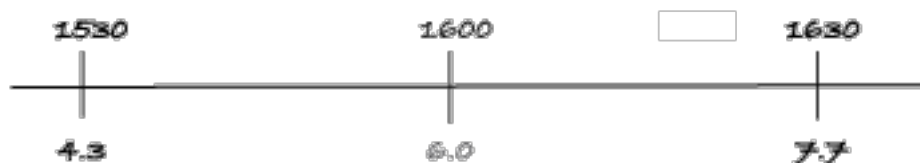
This means when is the water depth 7.0 ft

To solve this you will need to do some interpolation. The fastest way to do this is to sketch on a piece of paper. Follow the steps below

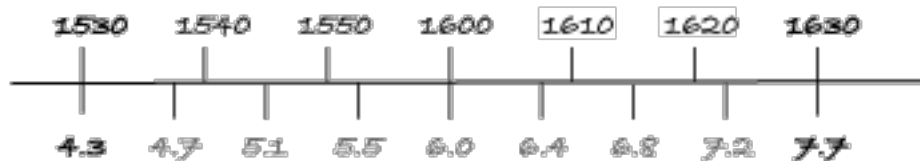
First Draw the extremities using the knowns. i.e at 1530 the tide is 4.3 ft and at 1630 the tide is 7.7. These, we know.



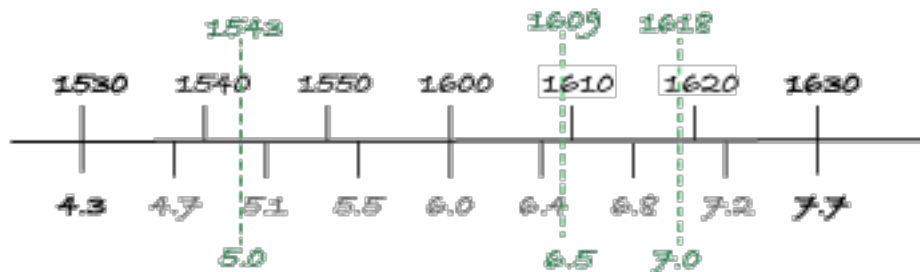
Then halve those to gain linear interpolation at the half way mark.



Then divide into further interpolations that make sense using your eyeball to estimate the section size and relative numbers.

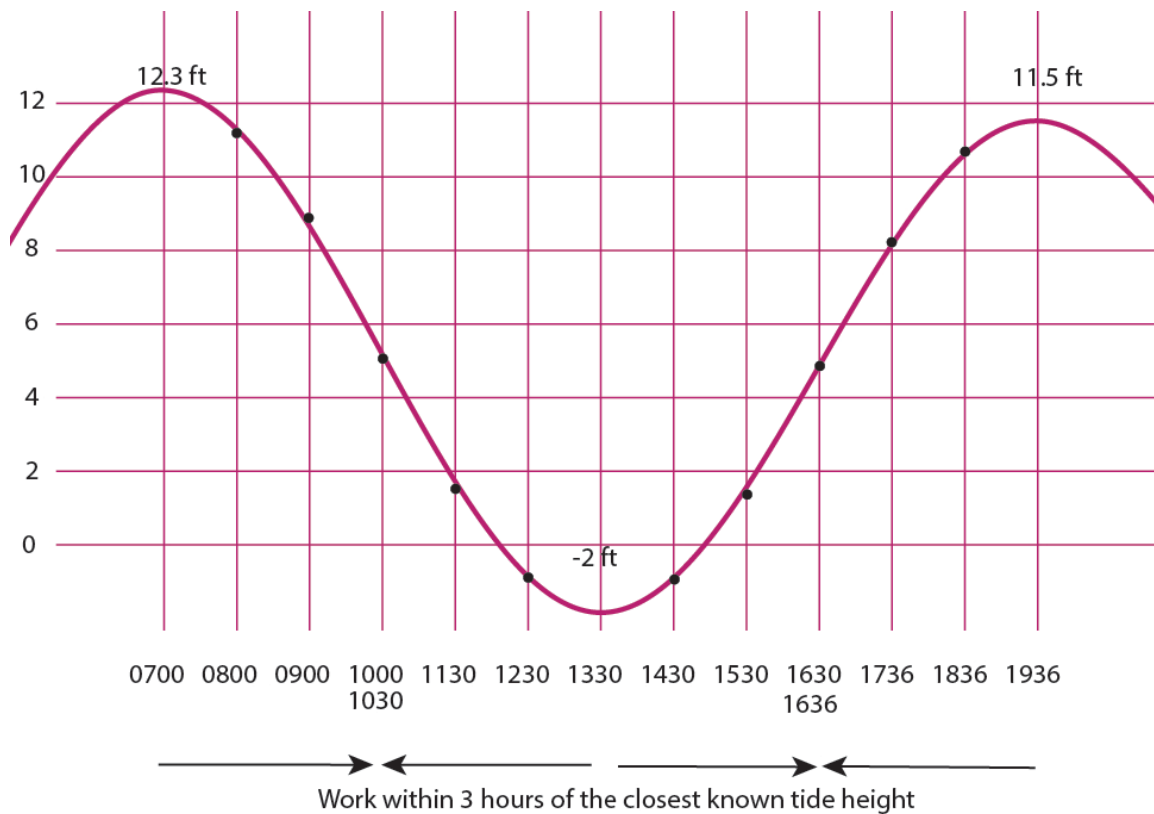


Then draw in your known points and read off on the other scale



- A) Boat Draw = 4.5 ft Safety=2 ft
This means when is the water depth 6.5 ft = 1609
- B) Boat Draw= 4.0 ft Safety=1.0 ft
This means when is the water depth 5.0 ft = 1543
- C) Boat Draw = 4.5 ft Safety=2.5 ft
This means when is the water depth 7.0 ft = 1618

This is a graphical representation of the tables above overlaid onto to a sinusoidal curve.



Remember that this is all assuming that the tide follows a semi-diurnal tide. Most places are but many are not. You will be able to see from the local tide tables if the tide is semi-diurnal, diurnal, or mixed.