



Aquatic Consulting Services

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Boating Tip #12: Time Conversions

When performing navigation problems using time, use the military time, 24-hour clock. For example 1:00 am is written as 0100, and 1:00 pm is written as 1300. When solving 60 D Street problems, always use time in minutes.

Converting Time

When converting time in hours and minutes to minutes, multiply the number of hours by 60 and then add the minutes.

Change hours into minutes

$$3:42 = (3 \times 60) + 42 = 222 \text{ minutes}$$

When converting time in minutes to hours and minutes, divide minutes by 60 to obtain hours. Multiply the quotient by 60 and subtract from the dividend (minutes). The remainder is the minutes. For example, to convert 3:42 into minutes, and conversely, to convert 222 minutes to hours and minutes.

Change minutes into hours and minutes

$$\begin{array}{r} 3:42 \\ 60 \overline{) 222} \\ \underline{-180} \\ 42 \end{array}$$

Determining Elapsed Time

To determine elapsed time, use military time. Subtract the starting time (time of departure) from ending time (time of arrival). If you “borrow” an hour, add 60 minutes. For example, you left from your marina at 3:42 pm (1542 hours) and arrived at your destination at 8:13 pm (2013). How long did the trip take?

$$\begin{array}{r|l}
 19 & \\
 \cancel{20} & 13 + 60 = 73 \\
 - 15 & 42 \\
 \hline
 4 & 31
 \end{array}$$

Example:

You spotted Anacapa's West Island at 0740 after sailing all night from Newport Beach. You departed from Newport at 1510. How long were you underway?

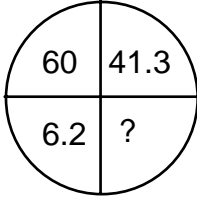
$$\begin{array}{r|l}
 14 & \\
 \cancel{15} & 10 + 60 = 70 \\
 - 07 & 40 \\
 \hline
 7 & 30
 \end{array}$$

7:30 = (7 x 60) + 30 = 450 minutes

Estimated Time of Arrival

Plot your point of departure or your current starting position (point A) and your destination (point B). Draw a line between the two points, and measure the distance with your dividers and the latitude scale. Find your boat speed from your knotmeter or GPS. Enter speed and distance and use the 60 D Street calculation to solve for time and determine how long the trip will take. Convert time in minutes to hours and minutes, and add to your time of departure.

For example, your 0900 position is off La Jolla at 32° 50' N, 117° 20' W and you are enroute to Dana Point at a speed of 6.2 knots. What is your estimated time of arrival?



$$\frac{60 \times 41.3}{6.2} = 399 \text{ minutes}$$

$$60 \overline{) 399} \begin{array}{r} 6:39 \\ -360 \\ \hline 39 \end{array}$$

09	00
+06	39
15	39

ETA 15:39