# Aquatic Consulting Services

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Boating Tip #13: 60 D Street

## Determining Speed • Determining Time • Determining Distance

A 60 D Street calculation is used to find speed, distance or time when two of the three factors are known. Place known values in the appropriate quadrants. Multiply across quadrants. Divide the product of the numbers in the upper quadrants by the product of the number in the lower quadrants, or vise versa.
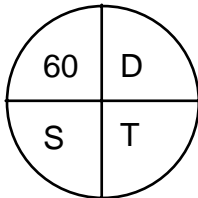
Speed = (60 x Distance) ÷ Time
Distance = (Speed x Time) ÷ 60
Time = (60 x Distance) ÷ Speed

Examples: Finding Distance

Cruising at 6.3 knots, it took 7:05 to cross the Outer Santa Barbara Passage from Cat Harbor (Santa Catalina Island) to Pyramid Cove (San Clemente Island). What was the distance?

$$\frac{6.3 \times 425}{60} = 44.6 \text{ nautical miles}$$
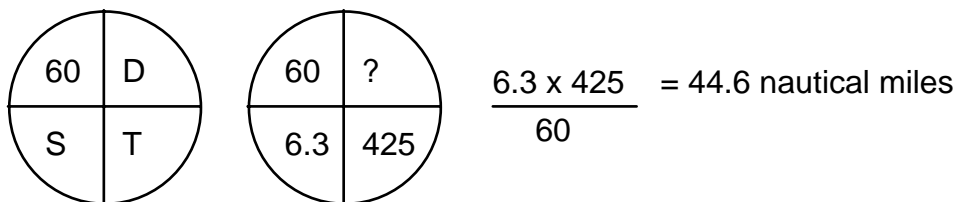
Time: 7:05 = (7 x 60) + 05 = 425 minutes

Speed: 6.3 knots

Distance: ?

You got underway at 0635 at a speed of 7.2 knots, and arrived at your destination at 1715. How far did you travel?

```
 16
 17   15 + 60 = 75
-06   35
_____
 10 | 40    10:40 = (10 x 60) + 40 = 640 minutes
```

$$\frac{7.2 \times 640}{60} = 76.8 \text{ nautical miles}$$

Time: 640 minutes

Speed: 7.2 knots

Distance: ?

Examples: Finding Speed

It took 55 minutes to travel 6 nautical miles from Mission Bay to the LaJolla kelp beds. What was your speed?

$$\frac{6 \times 60}{55} = 6.5 \text{ knots}$$

Time: 55 minutes

Speed: ?

Distance: 6 nautical miles

You depart from Avalon at 0800 and must travel 72 nautical miles back to your marina at Shelter Island in San Diego Bay. You want to arrive before sunset at 2015. What speed must be made?

```
   20 │ 15
 - 08 │ 00
─────────────
   12 │ 15    12:15 = (12 x 60) + 15 = 735 minutes
```

```
 ┌──────┐      ┌──────┐
 │ 60 │ D │    │ 60 │ 72 │      60 x 72
 │────┼───│    │────┼────│      ─────── = 5.8 knots
 │ S  │ T │    │ ?  │ 735│        735
 └──────┘      └──────┘
```

Time: 735 minutes

Speed: ?

Distance: 72 miles

Examples: Finding Time

Your vessel's top speed is 6.3 knots. You plan to sail a total distance of 275 nautical miles during your upcoming trip. How many hours will you be underway?

```
 ┌──────┐      ┌──────┐
 │ 60 │ D │    │ 60 │ 275│      60 x 275
 │────┼───│    │────┼────│      ──────── = 2619 minutes
 │ S  │ T │    │ 6.3│ ?  │        6.3
 └──────┘      └──────┘
```

```
                                    43:39
Time:       ?               60 │ 2619
                                  -240
Speed:      6.3 knots              ───
                                   219
Distance:   275 nautical miles    -180
                                   ───
                                    39
```

The distance from Dana Point to Avalon is 33 miles. Your vessel's average speed is 8.1 knots. How long will the trip take?
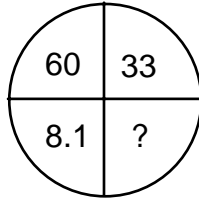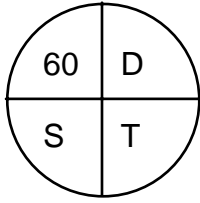
$$\begin{array}{c|c} 60 & D \\ \hline S & T \end{array} \qquad \begin{array}{c|c} 60 & 33 \\ \hline 8.1 & ? \end{array} \qquad \dfrac{60 \times 33}{8.1} = 244 \text{ minutes}$$

Time: ?

Speed: 8.1 knots

Distance: 33 nautical miles

$$\begin{array}{r} 4{:}04 \\ 60 \enclose{longdiv}{244} \\ -240 \\ \hline 04 \end{array}$$