



DISTANCE, SPEED, AND TIME

All piloting and maneuvering solutions contain three factors: **distance, speed, and time.**

Formula & 60 DST Table

This method for computing time, speed, or distance requires that you know two variables in order to determine the third:

$$D \text{ (nm)} = S \text{ (nm/h)} \times T \text{ (hrs)} \quad (\textit{Time in Hours})$$

$$D \text{ (nm)} = S \text{ (kn)} \times T \text{ (min)} / 60 \quad (\textit{Time in Minutes})$$

$$S = 60 D / T$$

$$T = 60 \times D / S$$

As an aid, use the DST Table:

60 x D (nm)	
S (kn)	T (min)

1. Fill in known values in proper units.
2. To find D, multiply across: $D = S \times T / 60$
3. To Find S -or- T, divide top by bottom:
 $S = 60 \times D / T$
 $T = 60 \times D / S$



Example 1: A ship's speed is 15 knots. How far will it travel in 20 minutes?

Solutions:

$$D = \text{_____ } nm$$

$$S = 15kn$$

$$T = 20min$$

a. Formula Solution: ($D (nm) = S (kn) \times T (min) / 60$)

$$D = S \times T / 60 = 15 \times 20 / 60 = 5.0nm$$

b. 60 DST Solution:

60 x D (nm)	
S (kn)	T (min)

60 x D	
15	20

$$D = 15 \times 20 / 60 = 300/60 = 5.0nm$$

Example 2: A ship travels 7 miles in 30 minutes. What is its speed?

Solutions:

$$D = 7nm$$

$$S = \text{_____ } kn$$

$$T = 30min$$

a. Formula Solution: ($D (nm) = S (kn) \times T (min) / 60$)

$$S = 60 D / T = 60 \times 7 / 30 = 14kn$$

b. 60 DST Solution:

60 x D (nm)	
S (kn)	T (min)

60 x 7	
S	30

$$S = 60 \times 7 / 30 = 420/30 = 14kn$$



Example 3: A ship's speed is 8 knots. How long will it take it to travel 6 miles?

Solutions:

$$D = 6nm$$

$$S = 8kn$$

$$T = \text{_____} min$$

a. Formula Solution: (D (nm) = S (kn) x T (min) / 60)

$$T = 60 \times D / S = 60 \times 6 / 8 = 45min$$

b. 60 DST Solution:

60 x D (nm)	
S (kn)	T (min)

60 x 6	
8	T

$$T = 60 \times 6 / 8 = 360/8 = 45min$$

Example 4: A ship's speed is 10 knots. How far will it travel in 2hrs - 20 min?

Solutions:

$$D = \text{_____} nm$$

$$S = 10kn$$

$$T = 2 \times 60 + 20 = 140min$$

a. Formula Solution: (D (nm) = S (kn) x T (min) / 60)

$$D = S \times T / 60 = 10 \times 140 / 60 = 23.3nm$$

b. 60 DST Solution:

60 x D (nm)	
S (kn)	T (min)

60 x D	
10	140

$$D = 10 \times 140 / 60 = 1400/60 = 23.3nm$$



Example 5: A ship travels 30 miles in 1hr - 12 min. What is its speed?

Solutions:

$$D = 30nm$$

$$S = \underline{\hspace{2cm}} kn$$

$$T = 1 \times 60 + 12 = 72 \text{ min}$$

a. Formula Solution: ($D \text{ (nm)} = S \text{ (kn)} \times T \text{ (min)} / 60$)

$$S = 60 D / T = 60 \times 30 / 72 = 25kn$$

b. 60 DST Solution:

60 x D (nm)	
S (kn)	T (min)

60 x 30	
S	72

$$S = 60 \times 30 / 72 = 1800/72 = 25kn$$

Example 6: A ship's speed is 12 knots. How long will it take it to travel 30 miles?

Solutions:

$$D = 30nm$$

$$S = 12kn$$

$$T = \underline{\hspace{2cm}} min$$

a. Formula Solution: ($D \text{ (nm)} = S \text{ (kn)} \times T \text{ (min)} / 60$)

$$T = 60 \times D / S = 60 \times 30 / 12 = 150min$$

$$= 150 / 60 = 2.5 \text{ hrs}$$

$$= 2 \text{ hrs} + (0.5 \text{ hr} \times 60 \text{ min}) = 2\text{hrs} - 30 \text{ mins}$$

b. 60 DST Solution:

60 x D (nm)	
S (kn)	T (min)

60 x 30	
12	T

$$T = 60 \times 30 / 12 = 1800/12 = 150min$$

$$= 150 / 60 = 2.5 \text{ hrs}$$

$$= 2 \text{ hrs} + (0.5 \text{ hr} \times 60 \text{ min}) = 2\text{hrs} - 30 \text{ mins}$$