

# Radar Navigation & Collision Avoidance.



By: Jens Jacobs  
 North Sea Navigator  
 9 Logan Hill Rd.  
 Northport, NY 11768-3429 USA



## Radar Fundamentals

1) Compute the minimum range from Radar to Target for the following pulse lengths:

A) 0.8      B) 0.6      C) 1.2 microseconds.

Meters                  Feet                  Yards

|    | Meters | Feet | Yards |
|----|--------|------|-------|
| A) |        |      |       |
| B) |        |      |       |
| C) |        |      |       |

Compute above problems to one digit past decimal point.

2) You are approaching an inlet from offshore. The inlet opening is 300 ft. wide in a straight coastline with good radar targets on both sides.

How close must you approach the inlet before you can detect the opening in the shoreline with a:

D) 5° or E) a 1° beam width radar?

Meters:                  Yards:                  Nautical Miles:

D) \_\_\_\_\_

E) \_\_\_\_\_

If you have a 1° beam width radar and observe a target dead ahead at 1.2 miles, could this be a tug, towing a barge on a 100 ft. hawser? ( )Yes ( )No

G) Give the minimum distance between towing and towed vessel before they can be detected as two targets by a 5° beam width radar at a range of 1.2 miles dead ahead. Note: Course of tug is 90° relative to own vessel.

Meters:                  Yards:                  Miles:

\_\_\_\_\_

H) Your radar is 23 ft. above the waterline. How far is it to the radar horizon in miles \_\_\_\_\_

Allowing 20 ft of target to appear above the radar horizon, at what range can you expect to begin seeing a 289 ft high target with your radar 21 ft. above sea-level.

miles \_\_\_\_\_ Note: 1mile = 6076 ft or 1852 Meters

## Collision Avoidance Plotting

### Situation #1

Own vessel is on course 060° and 20 knots.

At 22:10 a target is observed at 330 relative.

The range is 2.0 miles

At 22:16 the same target is observed at the same bearing and a range of 1.1 miles

From the above determine the following:

1) The nav. light/s you expect to see:

( ) Bow ( ) Red ( ) Green ( ) Stern

2) Course of other vessel: \_\_\_\_\_

3) Give speed of other vessel: \_\_\_\_\_ Kts.

4) Who is the "Stand On" vessel ( )Own ( )Other  
 With plenty of sea room in all directions, list the options the "Give Way" vessel has under the "Nav. Rules."

\_\_\_\_\_

### Situation #2

Everything remains the same as in situation #1 except that at 22:16 the range is 0.5 miles instead of 1.1 mile

5) The nav. light/s you can expect to see?

\_\_\_\_\_

6) Course of other vessel? \_\_\_\_\_

7) Speed of other vessel? \_\_\_\_\_ knots.

8) "Stand On" vessel is? ( )Own ( )Other

9) With plenty of sea room in all directions, list the options the "Give Way" vessel has under the nav. rules.

\_\_\_\_\_

Allright reserved by: North Sea Navigator  
 9 Logan Hill Rd., Northport, NY 11768-3429