Miscellaneous Mooring Calculations

Area of a circle $A = Pi \times R^2$

$Pi = 3.141592654$

Circumference of a circle 2 X Pi X Radius or Pi X Diameter

Volume of a sphere $V = 4/3 \text{ Pi } R^3$ or $1.33 \times 3.14 \times R^3$

Surface area of a sphere $A = 4 \text{ Pi } R^2$

Height X width X depth = volume

$In^2 / 1728 = ft^2$ $ft^2 \times 1728 = in^2$

1 ft^3 concrete = 150 pounds in air or 86 pounds in water

1 ft^3 granite = 170 pounds in air or 111 pounds in water

Sea water = 64 pounds per ft^3

Styrofoam displaces 1.8 pounds per ft^3 so provides approximately 55 – 60 pounds buoyancy

55 gallon concrete = 1,102.9 pounds (air)
55 gallon concrete with 10% steel = 1352.4 pounds (air)

30 gallon concrete = 601.6 pounds (air)
30 gallon concrete with 10% steel = 737.8 pounds (air)

Mooring Circle Calculation

$R1 = \sqrt{(1.5 \times MHW)^2 - (MLW)^2}$

$R2 = \sqrt{(.75 \text{ LOA})^2 - (d)^2}$ {d = 2.5 times height of pennant on bow to water}

R = R1 + R2 + LOA