#4 1.00 N of 14.0 karat gold $= 1 \times \frac{14.0}{24}$ N

Mass of 1.00 N of 14.0 karat $= \frac{14.0}{24} \frac{N}{9.8\ m/s^2} = \frac{14}{235.2}$ kg

Volume of Gold $= \frac{M}{\rho} = \frac{14}{235.2} \frac{kg}{19300\ kg/m^3}$

$= 3.08 \times 10^{-6}\ m^3$

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10 $P = \frac{F}{A} = \frac{50.0\ kg \times 9.80\ m/s^2}{\pi\ (6.00 \times 10^{-3}\ m)^2} = 4.33 \times 10^{6}$ Pa

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36 Condition of floating: Buoyant Force = Weight

i.e. Weight of displaced liquid = Weight of the cylind

$(\pi r^2 h)\ \rho\ g = M g \Rightarrow h = \frac{M}{\pi r^2 \rho}$

a) $h_{acid} = \frac{M}{\pi r^2 \rho_a} = \frac{6.00 \times 10^{-3}\ kg}{\pi\ (5.00 \times 10^{-3}\ m)^2 \times (1280\ kg/m^3)}$

$= 5.97 \times 10^{-2}\ m = 5.97$ cm

b) $h_{af} = \frac{M}{\pi r^2 \rho_{af}} =$ $=$

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44 a) Volume flow rate $Q = Av = (2.0 \times 10^{-4}\ m^2)(0.35\ m/s)$

$= 7.0 \times 10^{-5}\ m^3/s$

b) $A_1 V_1 = A_2 V_2$

$V_2 = V_1 \left(\frac{A_1}{A_2}\right) = (0.35\ m/s) \frac{2.0 \times 10^{-4}\ m^2}{0.28\ m^2} = 2.5 \times 10^{-4}$