$$D = \frac{M}{V} \qquad V = \frac{M}{D}$$

$$M = D \times V$$

① $D = ?$
   $M = 43.2g$
   $V = 96.5mL$

   $D = \frac{M}{V} = \frac{43.2g}{96.5mL} = \boxed{0.448 \, g/mL}$

② $D = ?$
   $M = 4.922g$
   $V = 4.0L$

   $D = \frac{M}{V} = \frac{4.922g}{4.0L} = \boxed{1.231 \, g/L}$ -or- $D = \frac{M}{V} = \frac{4.922g}{4000mL} = \boxed{.001239 \, g/mL}$

③ $D = 13.69 \, g/mL$
   $M = 2242g$
   $V = ?$

   $V = \frac{M}{D} = \frac{2242g}{13.69 \, g/mL} = \boxed{164.9 \, mL}$

④ $D = .880 \, g/cm^3$
   $M = 54g$
   $V = ?$

   $V = \frac{M}{D} = \frac{54g}{.880 \, g/cm^3} = \boxed{61.4 \, cm^3}$

⑤ $D = 1.25 \, g/mL$
   $M = ?$
   $V = 84mL$

   $M = D \times V = (1.25 \, g/mL) \times 84mL = \boxed{105 \, g}$

⑥ $D = 1.43g/L$
   $M = ?$
   $V = 25mL = .025L$

   $M = D \times V = (1.43 \, g/L) \times (.025 L) = \boxed{.0358 \, g}$

✱ I am changing the volume from mL to L so the units of volume (L) agree with the density units (g/L).

⑦
Sample A

$D = \dfrac{M}{V} = \dfrac{85g}{116mL} = .7333\ g/mL$

Sample B

$D = \dfrac{M}{V} = \dfrac{101g}{168mL} = .6029\ g/mL$

Sample C

$D = \dfrac{M}{V} = \dfrac{115g}{158mL}$

$D = .7278\ g/mL$

	V	M
A	116 mL	85 g
B	168 mL	101 g
C	158 mL	115 g

Samples A and C could be the same because their densities are very close.

⑧ $D = 19.3\ g/L$

$M = ?$

$V = l \times w \times h = 25cm \times 8cm \times 10.4cm = 2080cm^3 = 2080mL = 2.08\ L$ (need units to agree)

$M = D \times V = (19.3\ g/L) \times 2.08\ L = \boxed{40.1\ g}$

⑨ $D = 1.85\ g/mL$

$M = 64g$

$V = ?$

$V = \dfrac{M}{D} = \dfrac{64g}{1.85\ g/mL} = \boxed{34.6\ mL}$

⑩ Liquids are being combined, so the masses and volumes could be added up

$D = ?$

$M = 44.8g + 48.0g = 92.8\ g$

$V = 40mL + 50mL = 90\ mL$

$D = \dfrac{M}{V} = \dfrac{92.8g}{90mL} = \boxed{1.03\ g/mL}$

⑪

	Vol	Mass
A	48.5 mL	37.2 g
B	12.8 mL	174.1 g
C	64.7 mL	71.2 g

a) $D = \dfrac{M}{V}$

Ⓐ $D = \dfrac{37.2g}{48.5mL} = .767\ g/mL$

Ⓑ $D = \dfrac{M}{V} = \dfrac{174.1g}{12.8mL} = 13.6\ g/mL$

Ⓒ $D = \dfrac{M}{V} = \dfrac{71.2g}{64.7mL} = 1.10\ g/mL$

b) Liq. A will float to top (Lowest Density)

Liq B will sink to bottom (greatest Density)