

Chapter 1 : 28, 30, 32, 34, 36, 40, 53, 60

28. a. 1, 2 or 3 e. 2
b. 2 f. 3
c. 3 g. 3
d. 3 h. 4

30. a. 5×10^2
b. 4.8×10^2
c. 4.80×10^2
d. 4.800×10^2

32. a. 2.26
b. 8.4×10^{22}
c. 1.5×10^5
d. 6.67×10^{12}

34. a. 6.32×10^{25}
b. 7.82×10^{-17}
c. 0.2020
d. 1.161×10^{-2}
e. 2.29×10^{-27}
f. 0.81
g. 1130. or 1.130×10^3

36. a. $1 \text{Tg} \times \frac{10^{12} \text{g}}{1 \text{Tg}} \times \frac{1 \text{kg}}{10^3 \text{g}} = \mathbf{1 \times 10^9 \text{kg}}$
b. $6.50 \times 10^2 \text{Tm} \times \frac{10^{12} \text{m}}{1 \text{Tm}} \times \frac{1 \text{nm}}{10^{-9} \text{m}} = \mathbf{6.50 \times 10^{23} \text{nm}}$
c. $25 \text{fg} \times \frac{10^{-15} \text{g}}{1 \text{fg}} \times \frac{1 \text{kg}}{10^3 \text{g}} = \mathbf{2.5 \times 10^{-17} \text{kg}}$
d. $8.0 \text{dm}^3 \times \frac{1 \text{L}}{1 \text{dm}^3} = \mathbf{8.0 \text{L}}$
e. $1 \text{mL} \times \frac{1 \text{L}}{10^3 \text{mL}} \times \frac{1 \mu\text{L}}{10^{-6} \text{L}} = \mathbf{1 \times 10^3 \mu\text{L}}$
f. $1 \mu\text{g} \times \frac{10^{-6} \text{g}}{1 \mu\text{g}} \times \frac{1 \text{pg}}{10^{-12} \text{g}} = \mathbf{1 \times 10^6 \text{pg}}$

40. a. $1 \text{ ha} \times \frac{10^4 \text{ m}^2}{1 \text{ ha}} \times \frac{(1 \text{ km})^2}{(10^3 \text{ m})^2} = 1 \times 10^{-2} \text{ km}^2$

b. $5.5 \text{ acre} \times \frac{160 \text{ rod}^2}{1 \text{ acre}} \times \frac{(5.5 \text{ yd})^2}{1 \text{ rod}^2} \times \frac{(1 \text{ m})^2}{(1.0936 \text{ yd})^2} = 2.2 \times 10^4 \text{ m}^2$

$$2.2 \times 10^4 \text{ m}^2 \times \frac{(1 \text{ km})^2}{(10^3 \text{ m})^2} = 2.2 \times 10^{-2} \text{ km}^2$$

$$2.2 \times 10^4 \text{ m}^2 \times \frac{1 \text{ ha}}{10^4 \text{ m}^2} = 2.2 \text{ ha}$$

c. Area of lot = $120 \text{ ft} \times 75 \text{ ft} = 9.0 \times 10^3 \text{ ft}^2$

$$9.0 \times 10^3 \text{ ft}^2 \times \frac{(1 \text{ yd})^2}{(3 \text{ ft})^2} \times \frac{(1 \text{ rod})^2}{(5.5 \text{ yd})^2} \times \frac{1 \text{ acre}}{160 \text{ rod}^2} = 2.1 \times 10^{-1} \text{ acre}$$

$$\frac{\$6500}{0.21 \text{ acre}} = \$31,000 / \text{acre}$$

see part b above for acre/ha conversion; $\frac{\$31000}{1 \text{ acre}} \times \frac{5.5 \text{ acre}}{2.2 \text{ ha}} = \$77,000 / \text{ha}$

53. $1.2 \times 10^4 \text{ in}^3 \times \frac{(2.54 \text{ cm})^3}{(1 \text{ in})^3} \times \frac{1 \text{ mL}}{1 \text{ cm}^3} = 2.0 \times 10^5 \text{ mL}$

$$3.50 \times 10^2 \text{ lbs} \times \frac{453.59 \text{ g}}{1 \text{ lb}} = 1.59 \times 10^5 \text{ g}$$

$$d = \frac{\text{mass}}{\text{volume}} = \frac{1.59 \times 10^5 \text{ g}}{2.0 \times 10^5 \text{ mL}} = 0.81 \text{ g/mL} < 1.0 \text{ g/mL} \text{ floats}$$

60. $5.25 \text{ g Ag} \times \frac{1 \text{ cm}^3 \text{ Ag}}{10.5 \text{ g Ag}} \times \frac{1 \text{ mL Ag}}{1 \text{ cm}^3 \text{ Ag}} = 0.500 \text{ mL Ag} = 0.500 \text{ mL H}_2\text{O}$

$$11.2 \text{ mL} + 0.500 \text{ mL} = 11.7 \text{ mL}$$