

17A

1) $\frac{156 \cancel{\text{in.}}}{1} \times \frac{1 \text{ ft.}}{12 \cancel{\text{in.}}} = 13 \text{ ft.}$

2) $\frac{8 \cancel{\text{lbs.}}}{1} \times \frac{16 \text{ oz.}}{1 \cancel{\text{lb.}}} = 128 \text{ oz.}$

3) $\frac{7 \cancel{\text{cm}}}{1} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} = .07 \text{ m}$

4) $\frac{15 \cancel{\text{in.}}}{1} \times \frac{1 \cancel{\text{in.}}}{1} \times \frac{1 \text{ ft.}}{12 \cancel{\text{in.}}} \times \frac{1 \text{ ft.}}{12 \cancel{\text{in.}}} = \frac{15}{144} = .104 \text{ ft.}^2$

5) $\frac{25 \cancel{\text{gal.}}}{1} \times \frac{4 \cancel{\text{qts.}}}{1 \cancel{\text{gal.}}} \times \frac{2 \text{ pt.}}{1 \cancel{\text{qt.}}} = 200 \text{ pts.}$

6) $\frac{10 \cancel{\text{mi.}}}{1} \times \frac{1 \cancel{\text{mi.}}}{1} \times \frac{5280 \text{ ft.}}{1 \cancel{\text{mi.}}} \times \frac{5280 \text{ ft.}}{1 \cancel{\text{mi.}}} = 278,784,000 \text{ ft.}^2$

7) $\frac{13 \cancel{\text{oz.}}}{1} \times \frac{28 \text{ g}}{1 \cancel{\text{oz.}}} = 364 \text{ g}$

8) $\frac{9 \cancel{\text{liters}}}{1} \times \frac{1.06 \text{ qt.}}{1 \cancel{\text{liters}}} = 9.54 \text{ qts.}$

9) $\frac{350 \cancel{\text{cm}}}{1} \times \frac{.4 \text{ in.}}{1 \cancel{\text{cm}}} = 140 \text{ in.}$

10) $\frac{17 \cancel{\text{yds.}}}{1} \times \frac{.9 \text{ m}}{1 \cancel{\text{yd.}}} = 15.3 \text{ m}$

11) $\frac{4 \cancel{\text{km}}}{1} \times \frac{.62 \cancel{\text{mi.}}}{1 \cancel{\text{km}}} \times \frac{5280 \text{ ft.}}{1 \cancel{\text{mi.}}} = 13,094.4 \text{ ft.}$

12) $\frac{50 \cancel{\text{gal.}}}{1} \times \frac{4 \cancel{\text{qts.}}}{1 \cancel{\text{gal.}}} \times \frac{.95 \text{ l}}{1 \cancel{\text{qt.}}} = 190 \text{ liters}$

17B

1) $\frac{7 \cancel{\text{mi.}}}{1} \times \frac{5280 \text{ ft.}}{1 \cancel{\text{mi.}}} = 36,960 \text{ ft.}$

2) $\frac{6342 \cancel{\text{lbs.}}}{1} \times \frac{1 \text{ ton}}{2000 \cancel{\text{lbs.}}} = 3.171 \text{ tons}$

3) $\frac{7040 \cancel{\text{yds.}}}{1} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} \times \frac{1 \text{ mi.}}{5280 \text{ ft.}} = 4 \text{ mi.}$

4) $\frac{852 \cancel{\text{ft.}}}{1} \times \frac{1 \cancel{\text{ft.}}}{1} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 122,688 \text{ in.}^2$

5) $\frac{95 \cancel{\text{km}}}{1} \times \frac{1 \cancel{\text{km}}}{1} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} = 95,000,000 \text{ m}^2$

6) $\frac{580 \cancel{\text{g}}}{1} \times \frac{1 \text{ kg}}{1000 \cancel{\text{g}}} = .58 \text{ kg}$

7) $\frac{87 \cancel{\text{in.}}}{1} \times \frac{1 \cancel{\text{yd.}}}{36 \cancel{\text{in.}}} \times \frac{.9 \text{ m}}{1 \cancel{\text{yd.}}} = 2.175 \text{ m}$

8) $\frac{106 \cancel{\text{mi.}}}{1} \times \frac{1.6 \text{ km}}{1 \cancel{\text{mi.}}} = 169.6 \text{ km}$

9) $\frac{45 \cancel{\text{kg}}}{1} \times \frac{2.2 \cancel{\text{lbs.}}}{1 \cancel{\text{kg}}} \times \frac{16 \text{ oz.}}{1 \cancel{\text{lb.}}} = 1,584 \text{ oz.}$

10) $\frac{9 \cancel{\text{lbs.}}}{1} \times \frac{.45 \cancel{\text{kg}}}{1 \cancel{\text{lb.}}} \times \frac{1000 \text{ g}}{1 \cancel{\text{kg}}} = 4,050 \text{ g}$

$$\frac{9 \cancel{\text{lbs.}}}{1} \times \frac{16 \text{ oz.}}{1 \cancel{\text{lb.}}} \times \frac{28 \text{ g}}{1 \cancel{\text{oz.}}} = 4,032 \text{ g}$$

(differences due to rounding of metric/English equivalents.)

11) $\frac{3 \cancel{\text{liters}}}{1} \times \frac{1.06 \cancel{\text{qts.}}}{1 \cancel{\text{liter}}} \times \frac{2 \text{ pt.}}{1 \cancel{\text{qt.}}} = 6.36 \text{ pts.}$

12) $\frac{14 \cancel{\text{kg}}}{1} \times \frac{2.2 \cancel{\text{lbs.}}}{1 \cancel{\text{kg}}} = 30.8 \text{ lbs.}$

17C

1) $\frac{3 \cancel{\text{tons}}}{1} \times \frac{2000 \cancel{\text{lbs.}}}{1 \cancel{\text{ton}}} \times \frac{16 \text{ oz.}}{1 \cancel{\text{lb.}}} = 96,000 \text{ oz.}$

2) $\frac{24 \cancel{\text{pts.}}}{1} \times \frac{1 \cancel{\text{qt.}}}{2 \cancel{\text{pts.}}} \times \frac{1 \text{ gal.}}{4 \cancel{\text{qts.}}} = 3 \text{ gal.}$

3) $\frac{5 \cancel{\text{yds.}}}{1} \times \frac{1 \cancel{\text{yd.}}}{1} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} = 45 \text{ ft.}^2$

4) $\frac{2 \cancel{\text{ft.}}}{1} \times \frac{1 \cancel{\text{ft.}}}{1} \times \frac{1 \cancel{\text{ft.}}}{1} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} = \frac{2}{27} \text{ yd.}^3$

5) $\frac{4 \cancel{\text{mi.}}}{1} \times \frac{1 \cancel{\text{mi.}}}{1} \times \frac{1760 \text{ yds.}}{1 \cancel{\text{mi.}}} \times \frac{1760 \text{ yds.}}{1 \cancel{\text{mi.}}} = 12,390,400 \text{ yd.}^2$

6) $\frac{10 \cancel{\text{mi.}}}{1} \times \frac{1.6 \text{ km}}{1 \cancel{\text{mi.}}} = 16 \text{ km}$

7) $\frac{25 \cancel{\text{oz.}}}{1} \times \frac{28 \text{ g}}{1 \cancel{\text{oz.}}} = 700 \text{ g}$

8) $\frac{5 \cancel{\text{lbs.}}}{1} \times \frac{.45 \text{ kg}}{1 \cancel{\text{lb.}}} = 2.25 \text{ kg}$

9) $\frac{20 \cancel{\text{mi.}}}{1} \times \frac{1.1 \text{ yds.}}{1 \cancel{\text{mi.}}} = 22 \text{ yds.}$

10) $\frac{12 \cancel{\text{in.}}}{1} \times \frac{1.06 \text{ qt.}}{1 \cancel{\text{in.}}} = 12.72 \text{ qts.}$

11) $\frac{\text{H}_2}{\text{H}_2\text{O}} = \frac{2}{18}, \frac{\text{O}}{\text{H}_2\text{O}} = \frac{16}{18}, \frac{\text{H}_2}{\text{O}} = \frac{2}{16}$

12) $\frac{\text{MgO}}{234} = \frac{16}{18}$

$$\text{MgO} = \frac{234 \cdot 16}{18} = 208 \text{ g}$$

13) $\frac{\text{MH}}{234} = \frac{2}{18}$

$$\text{MH} = \frac{234 \cdot 2}{18} = 26 \text{ g}$$

14) $\frac{\text{pecan}}{\text{oak}} = \frac{7}{2}, \frac{\text{oak}}{\text{total}} = \frac{2}{9}, \frac{\text{pecan}}{\text{total}} = \frac{7}{9}$

15) given total, looking for pecan, so $\frac{\text{P}}{\text{T}} = \frac{7}{9}$

16) $\frac{\text{pecan}}{\text{total}} = \frac{\text{pecan}}{36} = \frac{7}{9} \Rightarrow \text{pecan} = \frac{36 \times 7}{9} = 28$

17) $\frac{1}{X} = \frac{2Y}{3} + A \Rightarrow \frac{1}{X} = \frac{2Y}{3} + \frac{3A}{3}, \frac{1}{X} = \frac{2Y + 3A}{3} \Rightarrow 1 = X \left(\frac{2Y + 3A}{3} \right) \Rightarrow \frac{3}{2Y + 3A} = X$

18) $\frac{A}{C} = 5 - \frac{1}{B} \Rightarrow \frac{A}{C} = \frac{5B}{B} - \frac{1}{B}, \frac{A}{C} = \frac{5B - 1}{B} \Rightarrow A = C \left(\frac{5B - 1}{B} \right) \Rightarrow A \left(\frac{B}{5B - 1} \right) = C \text{ or } C = \frac{AB}{5B - 1}$

19) $\frac{\text{O}}{\text{MgO}} = \frac{16}{40} = 40\%$

20) $\frac{\text{Mg}}{\text{MgO}} = \frac{24}{40} = 60\%$

17D

$$1) \frac{65 \cancel{\text{yds.}}}{1} \times \frac{3 \cancel{\text{ft.}}}{1 \cancel{\text{yd.}}} \times \frac{12 \text{ in.}}{1 \cancel{\text{ft.}}} = 2,340 \text{ in.}$$

$$2) \frac{10.6 \cancel{\text{m}}}{1} \times \frac{1 \text{ km}}{1,000 \cancel{\text{m}}} = .0106 \text{ km}$$

$$3) \frac{50 \cancel{\text{ft.}}}{1} \times \frac{1 \cancel{\text{ft.}}}{1} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} \times \frac{1 \text{ yd.}}{3 \cancel{\text{ft.}}} = 5 \frac{5}{9} \text{ yd.}^2$$

$$4) \frac{1,860 \cancel{\text{ft.}}}{1} \times \frac{1 \cancel{\text{ft.}}}{1} \times \frac{1 \cancel{\text{ft.}}}{1} \times \frac{1 \text{ yd.}}{36 \cancel{\text{ft.}}} \times \frac{1 \text{ yd.}}{36 \cancel{\text{ft.}}} \times \frac{1 \text{ yd.}}{36 \cancel{\text{ft.}}} = .04 \text{ yd.}^3$$

$$5) \frac{4 \cancel{\text{cm}}}{1} \times \frac{1 \cancel{\text{cm}}}{1} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} \times \frac{1 \text{ m}}{100 \cancel{\text{cm}}} = .0004 \text{ m}^2$$

$$6) \frac{45 \cancel{\text{ft.}}}{1} \times \frac{2.5 \text{ cm}}{1 \cancel{\text{ft.}}} = 112.5 \text{ cm}$$

$$7) \frac{7 \cancel{\text{qt.}}}{1} \times \frac{.95 \text{ l}}{1 \cancel{\text{qt.}}} = 6.65 \text{ l}$$

$$8) \frac{200 \cancel{\text{cm}}}{1} \times \frac{.4 \text{ in.}}{1 \cancel{\text{cm}}} = 80 \text{ in.}$$

$$9) \frac{3 \cancel{\text{mi}}}{1} \times \frac{.62 \text{ m}}{1 \cancel{\text{mi}}} = 1.86 \text{ mi.}$$

$$\frac{1.86 \cancel{\text{mi.}}}{1} \times \frac{5,280 \text{ ft.}}{1 \cancel{\text{mi.}}} = 9,820.8 \text{ ft}$$

$$10) \frac{9 \cancel{\text{kg}}}{1} \times \frac{2.2 \text{ lbs.}}{1 \cancel{\text{kg}}} = 19.8 \text{ lbs.}$$

$$11) \frac{\text{H}}{\text{HCl}} = \frac{1}{36}, \quad \frac{\text{Cl}}{\text{HCl}} = \frac{35}{36},$$

$$\frac{\text{H}}{\text{Cl}} = \frac{1}{35}$$

$$12) \frac{M_C}{612} = \frac{35}{36}$$

$$M_C = \frac{612 \times 35}{36} = 595 \text{ g}$$

$$13) \frac{M_H}{612} = \frac{1}{36}$$

$$M_H = \frac{612 \times 1}{36} = 17 \text{ g}$$

$$14) \frac{S}{T} = \frac{2}{7}, \quad \frac{\text{Dr}}{T} = \frac{5}{7},$$

$$\frac{S}{\text{Dr}} = \frac{2}{5}$$

15) given sunny, looking for dreary, so

$$\frac{S}{\text{Dr}} = \frac{2}{5}$$

$$16) \frac{S}{\text{Dr}} = \frac{2}{5} \Rightarrow \frac{32}{\text{Dr}} = \frac{2}{5}$$

$$5 \times 32 = 2\text{Dr}$$

$$\text{Dr} = 80 \text{ dreary days}$$

$$17) A = \frac{Ba}{b}$$

$$18) A = \frac{Ba}{b}$$

$$a = \frac{Ab}{B}$$

$$19) \frac{O_2}{CO_2} = \frac{16 + 16}{12 + 16 + 16} = \frac{32}{44} = 72.7\%$$

$$20) \frac{C}{CO_2} = \frac{12}{44} = 27.3\%$$

17E

$$1) \frac{28 \cancel{\text{ft.}}}{1} \times \frac{12 \cancel{\text{in.}}}{1 \cancel{\text{ft.}}} = 336 \text{ in.}$$

$$2) \frac{.28 \cancel{\text{km}}}{1} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} = 280 \text{ m}$$

$$3) \frac{8,000 \cancel{\text{yd.}}}{1} \times \frac{1 \cancel{\text{yd.}}}{1} \times \frac{1 \text{ mi.}}{1,760 \cancel{\text{yd.}}} \times \frac{1 \text{ mi.}}{1,760 \cancel{\text{yd.}}} = .0026 \text{ mi.}^2$$

$$4) \frac{39 \cancel{\text{km}}}{1} \times \frac{1 \cancel{\text{km}}}{1} \times \frac{1 \cancel{\text{km}}}{1} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} \times \frac{1000 \text{ m}}{1 \cancel{\text{km}}} = 3.9 \times 10^{10} \text{ m}^3$$

$$5) \frac{4.8 \cancel{\text{m}}}{1} \times \frac{1 \cancel{\text{m}}}{1} \times \frac{1000 \text{ mm}}{1 \cancel{\text{m}}} \times \frac{1000 \text{ mm}}{1 \cancel{\text{m}}} = 4.8 \times 10^6 \text{ mm}^2$$

$$6) \frac{12 \cancel{\text{yd.}}}{1} \times \frac{.9 \text{ m}}{1 \cancel{\text{yd.}}} = 10.8 \text{ m}$$

$$7) \frac{10,000 \cancel{\text{ft.}}}{1} \times \frac{1 \cancel{\text{mi.}}}{5,280 \cancel{\text{ft.}}} \times \frac{1.6 \text{ km}}{1 \cancel{\text{mi.}}} = 3.03 \text{ km}$$

$$8) \frac{3 \cancel{\text{lbs.}}}{1} \times \frac{.45 \cancel{\text{kg}}}{1 \cancel{\text{lb.}}} \times \frac{1000 \text{ g}}{1 \cancel{\text{kg}}} = 1350 \text{ g}$$

$$9) \frac{36 \cancel{\text{m}}}{1} \times \frac{1.1 \cancel{\text{yds.}}}{1 \cancel{\text{m}}} \times \frac{3 \text{ ft.}}{1 \cancel{\text{yd.}}} = 118.8 \text{ ft.}$$

$$10) \frac{340 \cancel{\text{g}}}{1} \times \frac{.035 \text{ oz.}}{1 \cancel{\text{g}}} = 11.9 \text{ oz.}$$

$$11) \frac{C}{CH_4} = \frac{12}{16}, \quad \frac{H_4}{CH_4} = \frac{4}{16},$$

$$\frac{C}{H_4} = \frac{12}{4}$$

$$12) \frac{M_C}{208} = \frac{12}{16}$$

$$M_C = \frac{12 \times 208}{16} = 156 \text{ g}$$

$$13) \frac{M_H}{208} = \frac{4}{16}$$

$$M_H = \frac{4 \times 208}{16} = 52 \text{ g}$$

$$14) \frac{D}{T} = \frac{7}{12}, \quad \frac{ND}{T} = \frac{5}{12},$$

$$\frac{D}{ND} = \frac{7}{5}$$

15) given not decorated, looking for decorated, so

$$\frac{D}{ND} = \frac{7}{5}$$

$$16) \frac{D}{ND} = \frac{D}{35} = \frac{7}{5}$$

$$D = \frac{7 \times 35}{5} = 49 \text{ decorated}$$

$$17) \frac{Y}{A - B} = X$$

$$18) \frac{Y}{X} = A - B$$

$$\frac{Y}{X} - A = -B$$

$$A - \frac{Y}{X} = B$$

$$19) \frac{O}{H_2O} = \frac{16}{2 + 16} = \frac{16}{18} = 89\%$$

$$20) \frac{H_2}{H_2O} = \frac{2}{18} = 11\%$$