

1.8 Temp & Unit Conversions KEY

(+16)

1b) $^{\circ}\text{C} = \frac{5}{9} (F^{\circ} - 32) = \frac{5}{9} (68 - 32) = \frac{5}{9} (36) = 20^{\circ}\text{C}$ ✓

c) $^{\circ}\text{F} = \frac{9}{5} (^{\circ}\text{C}) + 32 = \frac{9}{5} (-70) + 32 = -126 + 32 = -94^{\circ}\text{F}$ ✓

d) $^{\circ}\text{C} = \frac{5}{9} (F^{\circ} - 32) = \frac{5}{9} (145 - 32) = \frac{5}{9} (113) = 62.8^{\circ}\text{C}$ ✓

e) $^{\circ}\text{F} = \frac{9}{5} (^{\circ}\text{C}) + 32 = \frac{9}{5} (35) + 32 = 63 + 32 = 95^{\circ}\text{F}$ ✓

2. $3.58 \text{ short ton} \left| \frac{2000 \text{ lb}}{1 \text{ short ton}} \right| \frac{16 \text{ oz}}{1 \text{ lb}} \left| \frac{1 \text{ g}}{0.03527 \text{ oz}} \right| = 3.25 \times 10^6 \text{ g}$ ✓

3. $3.2 \text{ Btu} \left| \frac{252.0 \text{ calories}}{1 \text{ Btu}} \right| \frac{4.184 \text{ joules}}{1 \text{ calorie}} = 3.4 \times 10^3 \text{ joules}$ ✓

4. $2425 \text{ fathoms} \left| \frac{6 \text{ ft}}{1 \text{ fathom}} \right| \frac{12 \text{ in}}{1 \text{ ft}} \left| \frac{2.54 \times 10^{-2} \text{ m}}{1 \text{ in}} \right| = 4.435 \times 10^3 \text{ m}$ ✓

5. $9.6 \times 10^9 \text{ barrels} \left| \frac{42 \text{ gal}}{1 \text{ barrel}} \right| \frac{4 \text{ qt}}{1 \text{ gal}} \left| \frac{9.46 \times 10^{-4} \text{ m}^3}{1 \text{ qt}} \right| = 1.5 \times 10^9 \text{ m}^3$

6. $^{\circ}\text{C} = \frac{5}{9} (F^{\circ} - 32) = \frac{5}{9} (236 - 32) = \frac{5}{9} (204) = 113^{\circ}\text{C}$
 $\text{K} = ^{\circ}\text{C} + 273.15 = 113.3 + 273.15 = 386.5 \text{ K}$

7. $1.74 \text{ g} \left| \frac{1 \text{ Kg}}{1000 \text{ g}} \right| \frac{100 \text{ cm}}{1 \text{ m}} \left| \frac{100 \text{ cm}}{1 \text{ m}} \right| \frac{100 \text{ cm}}{1 \text{ m}} = \frac{1.74 \times 10^3 \text{ Kg}}{\text{m}^3}$

8. $7.19 \text{ g} \left| \frac{1 \text{ Kg}}{1000 \text{ g}} \right| \frac{100^3 \text{ cm}^3}{1^3 \text{ m}^3} = \frac{7.19 \times 10^3 \text{ Kg}}{\text{m}^3}$

9a) $5.91 \text{ Kg Chrome Yellow} \left| \frac{1000 \text{ g}}{1 \text{ Kg}} \right| \frac{1000 \text{ mg}}{1 \text{ g}} = 5.91 \times 10^6 \text{ mg Chrome Yellow}$

b) $753 \text{ mg Vitamin A} \left| \frac{1 \text{ g}}{1000 \text{ mg}} \right| \frac{10^6 \text{ } \mu\text{g}}{1 \text{ g}} = 7.53 \times 10^5 \text{ } \mu\text{g Vitamin A}$

c) $104 \text{ } \mu\text{m} \left| \frac{1 \text{ m}}{10^{12} \text{ } \mu\text{m}} \right| \frac{10^9 \text{ nm}}{1 \text{ m}} = 1.04 \times 10^{-1} \text{ nm}$

10. $275 \text{ carats diamonds} \left| \frac{200 \text{ mg}}{1 \text{ carat}} \right| \frac{1 \text{ g}}{1000 \text{ mg}} = 55.0 \text{ g diamonds}$