

5. Solve the following problems. Make sure you convert all measurements to the same power of ten. Your answer should be in correct scientific notation form and should include the correct number of significant digits.

a) $4.5 \times 10^7 \text{ m} + 6.45 \times 10^7 \text{ m} = 10.95 \times 10^7 \text{ m} = 11.0 \times 10^7 = 1.10 \times 10^8 \text{ m}$

b) $5.4 \times 10^7 \text{ g} + 7.8 \times 10^6 \text{ g} = 54 \times 10^6 + 7.8 \times 10^6 = 61.8 \times 10^6 = 62 \times 10^6 = 6.2 \times 10^7 \text{ g}$

c) $7.8 \times 10^{-6} \text{ cm} - 8.4 \times 10^{-7} \text{ cm} = 78 \times 10^{-7} - 8.4 \times 10^{-7} = 69.6 \times 10^{-7} = 70 \times 10^{-7} = 7.0 \times 10^{-6} \text{ cm}$

d) $2.3 \times 10^4 \text{ mm} - 4.2 \times 10^3 \text{ mm} = 2.3 \times 10^4 - 0.42 \times 10^4 = 1.88 \times 10^4 = 1.9 \times 10^4 \text{ mm}$

e) $6.7 \times 10^{-8} \text{ ng} + 8.2 \times 10^{-7} \text{ ng} = 0.67 \times 10^{-7} + 8.2 \times 10^{-7} = 8.87 \times 10^{-7} = 8.9 \times 10^{-7} \text{ ng}$

6. Solve the following multiplication and division problems. Your answer should be in correct scientific notation form and should include the correct number of significant digits.

a) $4.5 \times 10^2 \text{ m} \times 2.3 \times 10^{-4} \text{ m} = 1035 = 1.0 \text{ m}^2$

b) $2.0 \times 10^6 \text{ kg} \times 3.5 \times 10^{-9} \text{ m/s}^2 = 7.0 \times 10^{-3} \text{ kg m/s}^2 = 7.0 \times 10^{-3} \text{ N}$

c) $1.2 \times 10^7 \text{ m} \times 1.2 \times 10^7 \text{ m} = 1.44 \times 10^{14} = 1.4 \times 10^{14} \text{ m}^2$

d) $6.0 \times 10^7 \text{ m} / 1.5 \times 10^2 \text{ s} = 4.0 \times 10^5 \text{ m/s}$

e) $7.2 \times 10^{-4} \text{ m} / 1.2 \times 10^8 \text{ s} = 6.0 \times 10^{-12} \text{ m/s}$

f) $(5.5 \times 10^{-5} \text{ kg})(6.0 \times 10^4 \text{ m/s}^2) / 2.1 \times 10^4 \text{ m/s}^2 = 1.6 \times 10^{-4} \text{ kg}$

g) $(5.5 \times 10^{-5} \text{ m})(6.0 \times 10^4 \text{ m}^2) / 3.0 \times 10^{-6} \text{ m}^3 = 1,100,000 = 1.1 \times 10^6$