

PHYS 2311 Ch. 1 HW
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MisConcQ 2.

$$(3.84s)(37m/s) + (5.3s)(14.1m/s)$$
$$142.08m + 74.73m$$
$$216.81m$$

(e) 220m

MisConcQ 3.

(e) Need more information.

MisConcQ 4.

(b) 2

MisConcQ 5.

$$1.362 + 25.2 = 26.562$$
$$26.6$$

(b) 3

MisConcQ 6.

(b) how close a measurement is to the true value.

MisConcQ 7.

(a) repeatability of a measurement, using a given instrument.

MisConcQ 8.

(c) multiply by 9.

MisConcQ 10.

(d) All of the above.

Problem 1.

(a) 3

(b) 4

(c) 3

(d) 1

(e) 2

(f) 4

(g) 2

Problem 2.

(a) 5.859×10^0

(b) 2.18×10^1

(c) 6.8×10^{-3}

(d) 3.2865×10^2

(e) 2.19×10^{-1}

(f) 4.44×10^2

Problem 3.

- (a) 869,000
- (b) 9,100
- (c) 0.25
- (d) 476
- (e) 0.0000362

Problem 4.

$$\frac{0.35m}{3.25m} \times 100\% \approx \boxed{11\%}$$

Problem 5.

- (a) $\frac{0.2s}{4.5s} \times 100\% \approx \boxed{4\%}$
- (b) $\frac{0.2s}{45s} \times 100\% \approx \boxed{0.4\%}$
- (c) $\frac{0.2s}{270s} \times 100\% \approx \boxed{0.07\%}$

Problem 6.

$$(9.2 \times 10^3 s) + (6.3 \times 10^4 s) + (0.008 \times 10^6 s)$$

$$(0.92 \times 10^4 s) + (6.3 \times 10^4 s) + (0.8 \times 10^4 s)$$

$$\boxed{8.0 \times 10^4 s}$$

Problem 7.

$$(4.079 \times 10^2 m) \times (0.057 \times 10^{-1} m)$$

$$(407.9 m) \times (0.0057 m)$$

$$\boxed{2.3m^2}$$

Problem 8.

$$\frac{0.01m^2}{1.27m^2} \times 100\% \approx \boxed{1\%}$$

Problem 14.

- (a) 0.2866 m
- (b) 0.000 064 V
- (c) 0.430 g
- (d) 0.000 000 000 047 2 s
- (e) 0.000 000 022 5 m
- (f) 2 500 000 000 V

Problem 15.

- (a) 3 megavolts
- (b) 2 micrometers
- (c) 5 kilodays
- (d) 18 hectobucks
- (e) 900 nanoseconds

Problem 17.

- (a) ratio of the surface area of Earth compared to the surface area of the Moon

$$A = 4\pi r^2$$

$$A_E = 4\pi(6.38 \times 10^3 km)^2, \quad A_M = 4\pi(1.74 \times 10^3 km)^2$$

$$A_E = 4\pi(40.7 \times 10^6 km^2), \quad A_M = 4\pi(3.03 \times 10^6 km^2)$$

$$\frac{A_E}{A_M} = \frac{4\pi(40.7 \times 10^6 km^2)}{4\pi(3.03 \times 10^6 km^2)}$$

$$\frac{40.7 \times 10^6 km^2}{3.03 \times 10^6 km^2}$$

$$\boxed{13.4}$$

(b) ratio of the volume of Earth compared to the volume of the Moon

$$V = \frac{4}{3}\pi r^3$$

$$V_E = \frac{4}{3}\pi(6.38 \times 10^3 km)^3, \quad V_M = \frac{4}{3}\pi(1.74 \times 10^3 km)^3$$

$$V_E = \frac{4}{3}\pi(260. \times 10^9 km^3), \quad V_M = \frac{4}{3}\pi(5.27 \times 10^9 km^3)$$

$$\frac{V_E}{V_M} = \frac{\frac{4}{3}\pi(260. \times 10^9 km^3)}{\frac{4}{3}\pi(5.27 \times 10^9 km^3)}$$

$$\frac{260. \times 10^9 km^3}{5.27 \times 10^9 km^3}$$

$$\boxed{49.3}$$

Problem 18.

No, because:

$$\frac{15m}{1s} \times \frac{3600s}{1h} \times \frac{1mi}{1609.34m} = \frac{33.554mi}{1h}$$

$$33.554mi/h < 35mi/h$$

Problem 23.

(a)

$$1km \times \frac{100000cm}{1km} \times \frac{1in}{2.54cm} \times \frac{1mi}{63360} = 0.621mi$$

$$\boxed{\frac{0.621mi/h}{1km/h}}$$

(b)

$$1m \times \frac{100cm}{1m} \times \frac{1in}{2.54cm} \times \frac{1ft}{12in} = 3.28ft$$

$$\boxed{\frac{3.28ft/s}{1m/s}}$$

(c)

$$\frac{1km}{1h} \times \frac{1h}{3600s} \times \frac{1000m}{1km} = \frac{0.278m}{1s}$$

$$\boxed{\frac{0.278m/s}{1km/h}}$$

Problem 24.

(a)

$$1ft^2 \times \frac{1yd}{3ft} \times \frac{1yd}{3ft} = \boxed{\frac{1}{9}yd^2}$$

(b) Using earlier conversion from meters to feet.

$$1m^2 \times \frac{3.28ft}{1m} \times \frac{3.28ft}{1m} = \boxed{10.8ft^2}$$

Problem 54.

$$\frac{M}{L^3}$$

Problem 55.

(a)

$$[v] = [At^3] - [Bt]$$

$$\frac{L}{T} = [A]T^3 - [B]T$$

$$\boxed{A = \frac{L}{T^4}, \quad B = \frac{L}{T^2}}$$

(b)

$$\boxed{A = \frac{m}{s^4}, \quad B = \frac{m}{s^2}}$$

Problem 56.

(a) No, this is incorrect.

$$x = [vt^2] + [2at]$$

$$x = \frac{LT^2}{T} + \frac{LT}{T^2}$$

$$x = LT + \frac{L}{T}$$

(b) Yes, this is correct.

$$x = [v_0t] + [\frac{1}{2}at^2]$$

$$x = \frac{LT}{T} + \frac{LT^2}{T^2}$$

$$x = L + L$$

(c) Yes, this is correct.

$$x = [v_0t] + [2at^2]$$

$$x = \frac{LT}{T} + \frac{LT^2}{T^2}$$

$$x = L + L$$