HW Q hour 9/5
HW A B hour 9/6

Sig Fig Identification Practice

You don't need to print this but PLEASE copy the question and answer on your homework so we can go over it. Email me if you would like to know if you're doing it right and I'll check it!

Identify the following number of sig figs:

1. 0.00010 2
2. 348795 6
3. 2804 m 4
4. 2.84 km 3
5. 5.0920 5
6. 0.000304960 6
7. 4.06 3
8. 75,000.0 6
9. 10 cm 1
10. 10.00 cm 4
11. 0.023 km 2
12. 890 mL 2
13. 0.0001 g 1
14. 54.62 mol 4
15. 0.157 mL 3
16. 002.6090 mol 5
17. 780. 3
18. 0.157 atoms 3
19. 1.987200000 10
20. 8120 g 3

Round the following to 2 sig figs

1. 2.945 2.9
2. 4.09683 4.1
3. 23084 23000
4. 1.0934 1.1
5. 7.9029348 7.9
6. 9.99999 10.
7. 2348745 2300000
8. 34.04592 34
9. 5.094023 5.1
10. 230.953 230
11. 28.5 29

Significant Figures Worksheet

Significant Figures

1. Indicate how many significant figures there are in each of the following measured values.

246.32	5	1.008	4	700000	1
107.854	6	0.00340	3	350.670	6
100.3	4	14.600	5	1.0000	5
0.678	3	0.0001	1	320001	6

2. Calculate the answers to the appropriate number of significant figures.

```
  1 1
 32.567
135.0
+ 1.4567
169.037
169.0
```

```
  1 2 1
 246.24
 238.278
+ 98.3
582.818
582.8
```

```
  1 1 1
 658.0
  23.5478
+ 1345.29
2026.3378
2026.3
```

3. Calculate the answers to the appropriate number of significant figures.

a) 23.7 x 3.8 = 90 or 9.0×10^1

b) 45.76 x 0.25 = 11

c) 81.04 g x0.010 = 0.81

d) 6.47 x 64.5 = 417

e) 43.678 x 64.1 = 2800 or 2.8

f) 1.678 / 0.42 = 4.0

g) 28.367 / 3.74 = 7.56

h) 4278 / 1.006 = 4252

Classwork / HW

Name _____ Date _____ Hr _____

Sig Figs – 20 Questions

Rules:

1. When multiplying and dividing, your answer must contain the same number of **sig figs** as the measurement with the least amount of sig figs.
2. When adding and subtracting, your answer must contain the same number of **decimal places** as the measurement with the least amount of decimal places.

Directions – Complete the following as quickly and accurately as possible. Express your answer with the correct amount of sig figs and units.

1) 0.304 m * 1.2000 m

0.365 m

2) 400. g / 2.5 mL

160 g/mL

3) 1800 m^3 – 6.9 m^3

1793 m^3

4) 3.45 cm + 0.79864 cm

4.25 cm

5) 0.304 m * 1.2 m

0.36 m

6) 450 g / 58 mL

7.8 g/mL

7) 47.0 m / 2.2 s

21 m/s

8) 140 cm * 356 cm

$5.0 \times 10^4 cm^2$

$50000 cm^2$

9) 5.88 kg / 200 m^3

0.03 kg/m^3

10) 0.050 m * 4000.0 m

$200 m^2$

$2.0 \times 10^2 m^2$

11) 0.042 kg + 1.229 kg + 0.50 kg

1.77 kg

12) (0.054 kg + 1.33 kg) * 5.4 kg

7.5 kg^2

13) 170 cm^2 + 3.5 cm^2 - 28 cm^2

146 cm^2

14) 690000 m / (5.022 hr – 4.31 hr)

970000 m/hr

15) 35000 cm^3 / 0.250 cm

140000 cm^2

16) 14000 kg + 8000 kg + 590 kg

22590 kg

17) 3.14 m * (4.17 m + 2.1 m)

$20 m^2$

$2.0 \times 10^1 m^2$

18) 24.50 L + 4.30 L + 10.2 L

39.0 L

19) 1800. cm * 6.8 cm

12000 cm^2

20) 4.25 m * (1019 m^2 – 40 m^2) / (54.5 s * 31.3 s)

979

1700 s^2

2.43 m^3/s^2

SCIENTIFIC NOTATION

Name _____

Scientists very often deal with very small and very large numbers, which can lead to a lot of confusion when counting zeros! We have learned to express these numbers as powers of 10.

Scientific notation takes the form of $M \times 10^n$ where $1 \leq M < 10$ and "n" represents the number of decimal places to be moved. Positive n indicates the standard form is a large number. Negative n indicates a number between zero and one.

Example 1: Convert 1,500,000 to scientific notation.
We move the decimal point so that there is only one digit to its left, a total of 6 places.

$1{,}500{,}000 = 1.5 \times 10^6$

Example 2: Convert 0.000025 to scientific notation.
For this, we move the decimal point 5 places to the right.

$0.000025 = 2.5 \times 10^{-5}$

(Note that when a number starts out less than one, the exponent is always negative.)

Convert the following to scientific notation.

1. 0.005 = 5×10^{-3}
2. 5,050 = 5.05×10^3
3. 0.0008 = 8×10^{-4}
4. 1,000 = 1×10^3
5. 1,000,000 = 1×10^6
6. 0.25 = 2.5×10^{-1}
7. 0.025 = 2.5×10^{-2}
8. 0.0025 = 2.5×10^{-3}
9. 500 = 5.0×10^2
10. 5,000 = 5.0×10^3

Convert the following to standard notation.

1. 1.5×10^3 = 1500
2. 1.5×10^{-3} = 0.0015
3. 3.75×10^{-2} = 0.0375
4. 3.75×10^2 = 375
5. 2.2×10^5 = 220000
6. 3.35×10^{-1} = 0.335
7. 1.2×10^{-4} = 0.00012
8. 1×10^4 = 10000
9. 1×10^{-1} = 0.1
10. 4×10^0 = 4

Name _____ Date _____ Class _____

MATH HANDBOOK TRANSPARENCY WORKSHEET 2

Operations with Scientific Notation

Use with Appendix B, Operations with Scientific Notation

1. Perform the following operations and express the answers in scientific notation.

   a. $(1.2 \times 10^5) + (5.35 \times 10^6)$ 5.5×10^6

   b. $(6.91 \times 10^{-2}) + (2.4 \times 10^{-3})$ 7.2×10^{-2}

   c. $(9.70 \times 10^6) + (8.3 \times 10^5)$ 1.1×10^7

   d. $(3.67 \times 10^2) - (1.6 \times 10^1)$ 3.5×10^2

   e. $(8.41 \times 10^{-5}) - (7.9 \times 10^{-6})$ 7.6×10^{-5}

   f. $(1.33 \times 10^5) - (4.9 \times 10^4)$ 8.4×10^4

2. Perform the following operations and express the answers in scientific notation.

   a. $(4.3 \times 10^8) \times (2.0 \times 10^6)$ 8.6×10^{14}

   b. $(6.0 \times 10^3) \times (1.5 \times 10^{-2})$ 9.0×10^1

   c. $(1.5 \times 10^{-2}) \times (8.0 \times 10^{-1})$ 1.2×10^{-2}

   d. $\dfrac{7.8 \times 10^3}{1.2 \times 10^4}$ 6.5×10^{-1}

   e. $\dfrac{8.1 \times 10^{-2}}{9.0 \times 10^2}$ 9.0×10^{-5}

   f. $\dfrac{6.48 \times 10^5}{(2.4 \times 10^4)(1.8 \times 10^{-2})}$ 1.5×10^3

Name KEY Date _____ Hr _____

Significant Figures and Scientific Notation Review

Directions: Identify how many sig figs in each of the following measurements

1) 8.4100 m 5
2) 0.00110050 km 6
3) 5100 years 2
4) 210.00 L 5
5) 0.012 g 2
6) 5.1×10^3 kg 2
7) 0.51001 sec 5
8) 9410000 mm 3
9) 50.0 g 3
10) 30.100 mL 5
11) 0.23 lbs 2
12) 8900. cm 4
13) 0.10 m 2
14) 8.11×10^{-19} s 3
15) 100 g/mL 1

Directions: Solve each of the following according to sig figs. Remember **rules** and **units** for each!

1) 174 cm + 0.34 cm + 18.4 cm
193 cm
2) 4.50 m * 18.400 m
82.8 m^2
3) 60.0 g + 3.2 g + 131.00 g
194.2 g
4) 3.14 m * (5.12 m + 5.1 m)
32.0 m^2
5) 140.0 cm * 356.00 cm
49840 cm^2
6) 57.0 g / 60. mL
0.95 g/mL
7) 0.050 km * 10. km * 50.0 km
25 km^3
8) 1800.0 g – 500.000 g =
1300.0 g
9) 4.25 m * (1019 m^2 – 40 m^2) / 54.5 s
76.3 m^3/s
10) 8.13 km^3 / (1.14 km * 1.1 km)
6.3 km

Directions: Convert to standard form or scientific form.

1) 5.12×10^3 m 5120 m
2) 9.65×10^{-4} m 0.000965 m
3) 8.5×10^{-2} g 0.085 g
4) 2.71×10^4 kg 27100 kg
5) 78,000 min 7.8×10^4 min
6) 0.00053 mg 5.3×10^{-4} mg
7) 0.875 mL 8.75×10^{-1} mL
8) 2,687 L 2.687×10^3 L
1) 5×10^1 km 36 km
2) 6.452×10^7 mg 64520000 mg
3) 8.77×10^{-3} s 0.00877 s
4) 6.4×10^{-5} mm 0.000064 mm
5) 1.6 gal 1.6×10^0 gal
6) 0.0043 cm 4.3×10^{-3} cm
7) 250 days 2.5×10^2 day
8) 0.00000124 cm 1.24×10^{-6} cm

Name _____ Date_____ Hr _____

Directions: Solve the following problems. Make sure to place your answer in scientific notation.

1) $(6.02 \times 10^{23}\ cm)(8.65 \times 10^{4}\ cm)$

$5.21 \times 10^{28}\ cm^2$

2) $(6.02 \times 10^{23}\ m)(9.63 \times 10^{-2}\ m)$

$5.80 \times 10^{22}\ m^2$

3) $\dfrac{5.6 \times 10^{-18}\ mL}{8.9 \times 10^{8}\ mL}$

6.3×10^{-27}

4) $(-4.12 \times 10^{-4}\ in)(7.33 \times 10^{12}\ in)$

$-3.02 \times 10^{9}\ in^2$

5) $\dfrac{1.0 \times 10^{-14}\ cm^2}{4.2 \times 10^{-6}\ cm}$

$2.4 \times 10^{-9}\ cm$

6) $\dfrac{7.85 \times 10^{26}\ m^3}{6.02 \times 10^{23}\ m}$

$1.30 \times 10^{3}\ m^2$

7) $(-3.2 \times 10^{-7}\ km)(-8.6 \times 10^{-9}\ km)$

$2.8 \times 10^{-15}\ km^2$

8) $\dfrac{(5.4 \times 10^{4}\ mi)(2.2 \times 10^{7}\ mi)}{4.5 \times 10^{5}\ mi}$

$2.6 \times 10^{6}\ m$

9) $\dfrac{(6.02 \times 10^{23}\ g)(-1.42 \times 10^{-15}\ g)}{6.54 \times 10^{-6}\ g}$

$-1.31 \times 10^{14}\ g$

10. $\dfrac{(6.02 \times 10^{23}\ mm)(-5.11 \times 10^{-27}\ mm)}{-8.23 \times 10^{5}\ mm}$

$3.74 \times 10^{-9}\ mm$

11. $\dfrac{(3.1 \times 10^{14}\ in)(4.4 \times 10^{-12}\ in)}{-6.6 \times 10^{-14}\ in}$

$-2.1 \times 10^{16}\ in$

12. $\dfrac{(8.2 \times 10^{-3}\ min)(-7.9 \times 10^{7}\ min)}{7.3 \times 10^{-16}\ min}$

$-8.9 \times 10^{20}\ m$

13. $\dfrac{(-1.6 \times 10^{5}\ m)(-2.4 \times 10^{15}\ m)}{8.9 \times 10^{3}\ m}$

$4.3 \times 10^{16}\ m$

14. $(7.0 \times 10^{28}\ cm)(-3.2 \times 10^{-20}\ cm)(-6.4 \times 10^{35}\ cm)$

$1.4 \times 10^{45}\ cm^3$

Metric system

Name:_____

Date: Hour:

<----------/
/ -- kilo (k)
/
/ -- hecto (h)
/
/ -- deka (da)
/
/ -- unit (gram, meter, liter)
/
/ -- deci (d)
/
/ -- centi (c)
/
/ -- milli (m)
/---------->

1. 7 km = 7000 m
2. 7 m = 700 cm
3. 7 m = 0.007 mm
4. 5.2 kg = 5200 g
5. 6.81 g = 681 cg
6. 4.02 g = 4020 mg
7. 8000 L = 8 kL
8. 6000 cL = 60 L
9. 4000 mL = 4 L
10. 31 km = 31000 m
11. 12 m = 1200 cm
12. 17 m = 17000 mm
13. 4321 m = 4.321 km
14. 420 m = 0.420 km
15. 3 mm = 0.003 m
16. 0.5 km = 500 m
17. 0.15 L = 150 mL
18. 60 cm = 600 mm
19. 60 mm = 6 cm
20. 565 mL = 0.565 L
21. 500 dL = 5 daL
22. 0.03 hm = 3 m
23. 6000 cg = 0.6 hg
24. 3.5 m = .035 hm
25. 99.305 dL = 9930.5 mL
26. 0.005 kL = 0.05 hL
27. 10000 m^2 = _____ km^2
28. 100.0 m^2 = 100000 mm^2
29. 0.005 hm^2 = 5 dm^2
30. 0.05 hm^2 = 50 dm^2

English System

Name:_____ #____

Date: Block:

Length

12 inches = 1 foot
3 ft. = 1 yard
5280 ft. = 1 mile

Volume

60 minims = 1 dram
32 drams = 1 gill
4 gill = 1 pint
16 ounces = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon

Weight

16 dram = 1 ounce
16 ounce = 1 pound
2240 pound = 1 Ton (long)
2000 pound = 1 Ton (short) or ton

Speed

1.466 ft/sec = 1 mile/hr
0.06821 mile/hr = 1 ft/sec
88 ft/min = 1 mile/hr
0.01136 mile/hr = 1 ft/min

1. 12 inches = _____ ft
2. 7 inches = _____ ft
3. 144 ft = _____ inches
4. 6 ' = _____ "
5. 681 ft = _____ miles
6. 40,200 ft = _____ miles
7. 80 miles = _____ ft
8. 6 miles = _____ inches
9. 192 ounces = _____ pounds
10. 31 pounds = _____ ounces
11. 12 ton (long) = _____ pounds
12. 2422 pounds = _____ ton
13. 1.5 ton = _____ ounces
14. 80,000 ounces = _____ ton
15. 80 ounces = _____ pints
16. 24.5 pints = _____ quarts
17. 12 gallon = _____ quarts
18. 3 gallons = _____ pints
19. 448 ounces = _____ gallon
20. 65 miles/hr = _____ ft/sec
21. 500 ft/sec = _____ miles/hr
22. 1.3 miles = _____ inches
23. 6,700,400 inches = _____ miles
24. 3.5 ton = _____ ounces
25. 99.305 quarts = _____ pints
26. 0.005 gallons = _____ ounces
27. 6.5 ft/sec = _____ miles/hr
28. 7.3 miles = _____ ft
29. 12 ton = _____ ton (long)
30. 3500 yards = _____ miles

English System

1. $12\text{in} \times \frac{1\text{ft}}{12\text{in}} = 1.0\text{ft}$

2. $7\text{in} \times \frac{1\text{ft}}{12\text{in}} = 0.6\text{ft}$

3. $144\text{ft} \times \frac{12\text{in}}{1\text{ft}} = 1730\text{in}$

4. $6' \times \frac{12''}{1'} = 70''$

5. $633\text{ft} \times \frac{1\text{mi.}}{5280\text{ft}} = 0.12\text{mi}$

6. $40200\text{ft} \times \frac{1\text{mi}}{5280\text{ft}} = 77.3\text{mi.}$

7. $80\text{mi.} \times \frac{5280\text{ft}}{1\text{mi}} = 400000\text{ft}$

8. $6\text{mi} \times \frac{5280\text{ft}}{1\text{mi}} \times \frac{12\text{in}}{1\text{ft}} = 400800\text{in}$

9. $192\text{oz} \times \frac{1\text{lb}}{16\text{oz}} = 12\text{lbs}$

10. $31\text{lbs} \times \frac{16\text{oz}}{1\text{lbs}} = 590\text{oz}$

$12 \text{ ton (long)} \times \frac{2240 \text{ lbs}}{1 \text{ ton long}} = 27000 \text{ lbs}$

$2422 \text{ lbs} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = 1.211 \text{ ton}$

$1.5 \text{ ton} \times \frac{2000 \text{ lbs}}{1 \text{ ton}} \times \frac{NO2}{1 \text{ lbs}} = 46000 \text{ oz}$

$46000 \text{ oz} \times \frac{1 \text{ lbs}}{16 \text{ oz}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = 2.5 \text{ ton}$

$80 \text{ oz} \times \frac{1 \text{ pt}}{16 \text{ oz}} = 5 \text{ pt}$

$24.5 \text{ pt} \times \frac{1 \text{ qt}}{2 \text{ pt}} = 12.3 \text{ qt}$

$12 \text{ gal} \times \frac{4 \text{ qt}}{1 \text{ gal}} = 44 \text{ qt}$

$3 \text{ gal} \times \frac{4 \text{ qt}}{1 \text{ gal}} \times \frac{2 \text{ pt}}{1 \text{ qt}} = 24 \approx 20 \text{ pt}$

$44 \text{ oz} \times \frac{1 \text{ pt}}{16 \text{ oz}} \times \frac{1 \text{ qt}}{2 \text{ pt}} \times \frac{1 \text{ gal}}{4 \text{ qt}} = 350 \text{ gal}$

$65 \frac{\text{mi}}{\text{hr}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ s}} = 95 \text{ ft/s}$

500 ft / sec × 1 mi / 5280 ft × 60 s / 1 min × 60 min / 1 hr = 390 mi/hr

1.3 mi × 5280 ft / 1 mi × 12 in / 1 ft = 82000 in

6700400 in × 1 ft / 12 in × 1 mi / 5280 ft = 105.75 mi

3.5 ton × 2000 lbs / 1 ton × 16 oz / 1 lb = 112000 oz

99.305 qt × 2 pt / 1 qt = 198.61 pt

0.005 gal × 4 qt / 1 gal × 2 pt / 1 qt × 16 oz / 1 pt = 0.6 oz

0.5 ft / sec × 1 mi / 5280 ft × 60 sec / 1 min × 60 min / 1 hr = 4.3 mi/hr

7.3 mi × 5280 ft / 1 mi = 39000 ft

12 ton × 2000 lbs / 1 ton × 1 ton (long) / 2240 lbs = 11 ton (long)

3500 yds × 3 ft / 1 yd × 1 mi / 5280 ft = 2.0 mi

Dimensional Analysis Worksheet #2

DA2

1. 261 g → kg
2. 3.00 days → seconds
3. 9,474 mm → cm
4. 0.73 kL → L
5. 5.93 cm^3 → m^3
6. 1 ft^3 → m^3
7. 175 lbs → kg
8. 4.65 km → m
9. 0.74 Kcal/min to cal/sec
10. 1.42 g/cm^2 to mg/mm^2
11. 9.81 m/s^2 to ft/hr^2
12. 8.41 g/mL to Kg/L
13. 3.8 Km/sec to miles/year
14. 8.24 g/cm^2 to mg/mm^2

15. Convert 2.05 x 10^5 seconds into years.
16. Traveling at 65 miles/hour, how many minutes will it take to drive 125 miles to San Diego?
17. Convert 50 years into seconds. Express your answer in scientific notation.
18. Traveling at 65 miles/hour, how many feet can you travel in 22 minutes? (1 mile = 5280 feet)
19. The total amount of fresh water on earth is estimated to be 3.73 x 10^8 km^3. What is this volume in cubic meters? In liters? $1 cm^3 = 1 mL$
20. Sally Leadfoot was pulled over on her way from Syracuse to Ithaca by an officer claiming she was speeding. The speed limit is 65 mi/hr and Sally had traveled 97 km in 102 minutes. How fast was Sally's average speed? Does she deserve a ticket?
21. Marie was trying to make her favorite recipe but was not sure of the conversions. Would you eat these cookies?

Recipe	Marie's Conversions
2 ¼ Cups flour	0.5 litre flour
0.5 lbs choc. chips	2000 g choc. chips
325 degrees Fahrenheit	373 Kelvin

22. Winnipeg is refilling the pool. How many gallons of water will it take if the pool is 50m by 25m by 1.5m? (1 gallon = 3.786 L)
23. At a given point in its orbit, the moon is 2.4 x 10^5 miles from earth. How long does it take light from a source on earth to reach a reflector on the moon and then return to earth? (speed of light is 3.0 x 10^8 m/s)

261 g $\frac{1\ kg}{1000\ g}$ = 0.261 kg

3.00 day $\frac{24\ hr}{1\ day}$ $\frac{60\ min}{1\ hr}$ $\frac{60\ s}{1\ min}$ = 259000 s

947.4 mm $\frac{1\ cm}{10\ mm}$ = 947.4 cm

0.73 kL $\frac{1000\ L}{1\ kL}$ = 730 L

5.93 cm^3 $\frac{1\ m^3}{10^6\ cm^3}$ = $5.93 \times 10^{-6}\ m^3$

14 ft^3 $\frac{12\ in^3}{1\ ft^3}$ $\frac{2.54\ cm^3}{1\ in^3}$ $\frac{1\ m^3}{100\ cm^3}$ = 0.3 m^3

175 lbs $\frac{454\ g}{1\ lbs}$ $\frac{1\ kg}{1000\ g}$ = 79.5 kg

4.65 km $\frac{1000\ m}{1\ km}$ = 4650 m

0.74 $\frac{Kcal}{min}$ $\frac{1\ min}{60\ s}$ $\frac{1000\ cal}{1\ Kcal}$ = 12 cal/s

1.42 $\frac{g}{cm^2}$ $\frac{1000\ mg}{1\ g}$ $\frac{1\ cm^2}{10^2\ mm^2}$ = 14.2 mg/mm²

$$9.61\ \frac{m}{s^2}\ \frac{100\,cm}{1\,m}\ \frac{1\,in}{2.54\,cm}\ \frac{1\,ft}{12\,in}\ \frac{60^2\,s^2}{1\,min^2}\ \frac{60^2\,min^2}{1\,hr^2}$$

$$= 4.17 \times 10^8\ ft/hr^2$$

$$8.0\ \frac{lb}{yd^3}\ \frac{1\,kg}{2.2\,lb}\ \frac{1000\,mL}{1\,L} = 8.41\ kg/L$$

$$3.6\ \frac{km}{sec}\ \frac{1000\,m}{1\,km}\ \frac{100\,cm}{1\,m}\ \frac{1\,in}{2.54\,cm}\ \frac{1\,ft}{12\,in}\ \frac{1\,mi}{5280\,ft}\ \frac{60\,sec}{1\,min}$$

$$\frac{60\,min}{1\,hr}\ \frac{24\,hr}{1\,day}\ \frac{365\,day}{1\,yr} = 7.4 \times 10^7\ mi/yr$$

$$8.24\ \frac{g}{cm^3}\ \frac{1000\,mg}{g}\ \frac{1\,cm^3}{10^3\,mm^3} = 82.4\ mg/mm^3$$

$$2.05 \times 10^5\ s\ \frac{1\,min}{60\,s}\ \frac{1\,hr}{60\,min}\ \frac{1\,day}{24\,hr}\ \frac{1\,yr}{365\,day}$$

$$= 6.50 \times 10^{-3}\ yr$$

$$125\,min\ \frac{1\,hr}{65\,min}\ \frac{60\,min}{1\,hr} = 115\,min$$

$$50\,yr\ \frac{365\,day}{1\,yr}\ \frac{24\,hr}{1\,day}\ \frac{60\,min}{1\,hr}\ \frac{60\,s}{1\,min} = 2 \times 10^9\,s$$

$22\,\text{min} \times \frac{1\,\text{hr}}{60\,\text{min}} \times \frac{65\,\text{mi}}{1\,\text{hr}} \times \frac{5280\,\text{ft}}{1\,\text{mi}} = 1.3 \times 10^5\,\text{ft}$

$3.73 \times 10^8\,\text{km} \times \frac{1000^3\,\text{m}^3}{1\,\text{km}^3} = 3.73 \times 10^{17}\,\text{m}^3$

$3.73 \times 10^{17}\,\text{m}^3 \times \frac{100^3\,\text{cm}^3}{1\,\text{m}^3} \times \frac{1\,\text{mL}}{1\,\text{cm}^3} \times \frac{1\,\text{L}}{1000\,\text{mL}} = 3.73 \times 10^{20}\,\text{L}$

$97\,\text{km} \times \frac{1000\,\text{m}}{1\,\text{km}} \times \frac{100\,\text{cm}}{1\,\text{m}} \times \frac{1\,\text{in}}{1.5\,\text{cm}} \times \frac{1\,\text{mi}}{12 \times 5280\,\text{in}} \times \frac{60\,\text{min}}{1\,\text{hr}}$
$192\,\text{min} \times \frac{1\,\text{km}}{1\,\text{min}} \times \frac{1\,\text{mi}}{2.54\,\text{cm}} \times \frac{12 \times 5280\,\text{in}}{1\,\text{mi}} \times \frac{1\,\text{hr}}{60\,\text{min}}$

35 mi/hr no she wasn't speeding

$2.2\,\text{cup} \times \frac{400\,\text{g}}{1\,\text{cup}} \times \frac{1\,\text{lb}}{454\,\text{g}} \times \frac{16\,\text{oz}}{1\,\text{lb}} \times \frac{946\,\text{mL}}{32\,\text{oz}} \times \frac{1\,\text{L}}{1000\,\text{mL}}$
$0.53\,\text{L}$

$0.5\,\text{lbs} \times \frac{454\,\text{g}}{1\,\text{lbs}} = 209\,\text{g}$

her conversions were wrong!

22) $50\text{m} \times 25\text{m} \times 1.5\text{m}$

$50\text{m} \left|\frac{100\text{cm}}{1\text{m}}\right. = 5000\text{cm}$ X

$25\text{m} \left|\frac{100\text{cm}}{1\text{m}}\right. = 2500\text{cm}$ X

$1.5\text{m} \left|\frac{100\text{cm}}{1\text{m}}\right. = 150\text{cm}$

$1875000000\text{cm}^3 \left|\frac{1\text{mL}}{1\text{cm}^3}\right. \left|\frac{1\text{qt}}{946\text{mL}}\right. \left|\frac{1\text{gal}}{4\text{qt}}\right. =$

$5.0 \times 10^5\ \text{gal}$

23) $2.4 \times 10^5\text{mi} \left|\frac{5280\text{ft}}{1\text{mi}}\right. \left|\frac{12\text{in}}{1\text{ft}}\right. \left|\frac{2.54\text{cm}}{1\text{in}}\right. \left|\frac{1\text{m}}{100\text{cm}}\right. \left|\frac{1\text{min}}{60\text{s}}\right. = 0.021 \times 2 = 0.042\ \text{min}$

$3.00 \times 10^8\ \text{m}$

round to p