 Name: _____ Period: _____

This

HONORS PREPARATION REVIEW PACKET

Belongs to...

_____

Due the first day back.

Infinite Algebra 1 Name_____

One-Step Equations

Date_____ Period____

Solve each equation.

1) $26 = 8 + v$

2) $3 + p = 8$

3) $15 + b = 23$

4) $-15 + n = -9$

5) $m + 4 = -12$

6) $x - 7 = 13$

7) $m - 9 = -13$

8) $p - 6 = -5$

9) $v - 15 = -27$

10) $n + 16 = 9$

11) $-104 = 8x$

12) $14b = -56$

13) $-6 = \frac{b}{18}$

14) $10n = 40$

Kuta Software - Infinite Algebra 1 Name_____

Two-Step Equations

Date_____ Period____

Solve each equation.

1) $6 = \frac{a}{4} + 2$

2) $-6 + \frac{x}{4} = -5$

3) $9x - 7 = -7$

4) $0 = 4 + \frac{n}{5}$

5) $-4 = \frac{r}{20} - 5$

6) $-1 = \frac{5 + x}{6}$

7) $\frac{v + 9}{3} = 8$

8) $2(n + 5) = -2$

9) $-9x + 1 = -80$

10) $-6 = \frac{n}{2} - 10$

11) $-2 = 2 + \frac{v}{4}$

12) $144 = -12(x + 5)$

Kuta Software - Infinite Algebra 1 Name_____

Multi-Step Equations

Date_____ Period____

Solve each equation.

1) $-20 = -4x - 6x$

2) $6 = 1 - 2n + 5$

3) $8x - 2 = -9 + 7x$

4) $a + 5 = -5a + 5$

5) $4m - 4 = 4m$

6) $p - 1 = 5p + 3p - 8$

7) $5p - 14 = 8p + 4$

8) $p - 4 = -9 + p$

9) $-8 = -(x + 4)$

10) $12 = -4(-6x - 3)$

11) $14 = -(p - 8)$

12) $-(7 - 4x) = 9$

13) $-18 - 6k = 6(1 + 3k)$

14) $5n + 34 = -2(1 - 7n)$

15) $2(4x - 3) - 8 = 4 + 2x$

16) $3n - 5 = -8(6 + 5n)$

17) $-(1 + 7x) - 6(-7 - x) = 36$

18) $-3(4x + 3) + 4(6x + 1) = 43$

19) $24a - 22 = -4(1 - 6a)$

20) $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

Kuta Software - Infinite Algebra 1 Name_____

Solving Systems of Equations by Elimination

Date_____ Period____

Solve each system by elimination.

1) $-4x - 2y = -12$
$4x + 8y = -24$

2) $4x + 8y = 20$
$-4x + 2y = -30$

3) $x - y = 11$
$2x + y = 19$

4) $-6x + 5y = 1$
$6x + 4y = -10$

5) $-2x - 9y = -25$
$-4x - 9y = -23$

6) $8x + y = -16$
$-3x + y = -5$

7) $-6x + 6y = 6$
$-6x + 3y = -12$

8) $7x + 2y = 24$
$8x + 2y = 30$

9) $5x + y = 9$
$10x - 7y = -18$

10) $-4x + 9y = 9$
$x - 3y = -6$

11) $-3x + 7y = -16$
$-9x + 5y = 16$

12) $-7x + y = -19$
$-2x + 3y = -19$

 Name_____

Solving Systems of Equations by Substitution

Date_____ Period____

Solve each system by substitution.

1) $y = 6x - 11$
$-2x - 3y = -7$

2) $2x - 3y = -1$
$y = x - 1$

3) $y = -3x + 5$
$5x - 4y = -3$

4) $-3x - 3y = 3$
$y = -5x - 17$

5) $y = -2$
$4x - 3y = 18$

6) $y = 5x - 7$
$-3x - 2y = -12$

7) $-4x + y = 6$
$-5x - y = 21$

8) $-7x - 2y = -13$
$x - 2y = 11$

9) $-5x + y = -2$
$-3x + 6y = -12$

10) $-5x + y = -3$
$3x - 8y = 24$

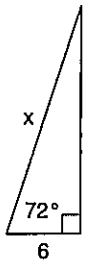
Kuta Software - Infinite Geometry Name_____

Solving Right Triangles

Date_____ Period____

Find the missing side. Round to the nearest tenth.

1)



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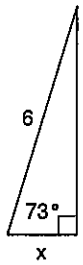

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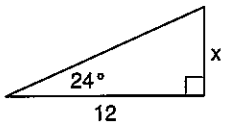

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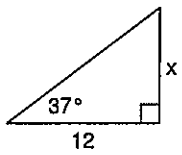

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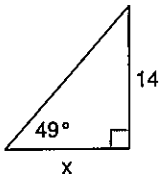

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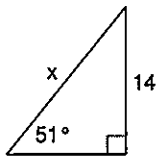

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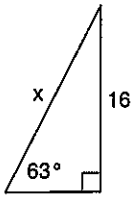

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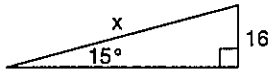

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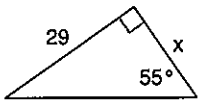

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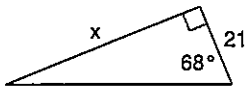

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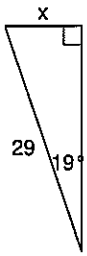

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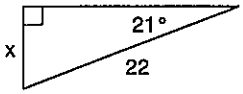

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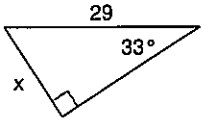

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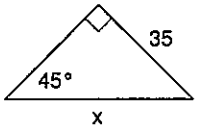

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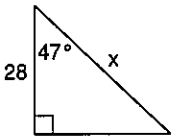

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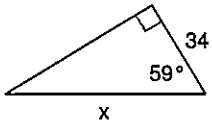


Critical thinking question:

17) Write a new problem that is similar to the others on this worksheet. Solve the question you wrote.

Significant Figures

The **significant figures** are the digits in a number which represent the accuracy of that number. All non-zero digits in a number are significant. But zeros may be just "place holders". The following two examples show the use of place holders in numbers.

.085 This number has an accuracy of **two significant figures.**

In this number the "8" and "5" are measured digits and are therefore significant. The zero is just a place holder that shows the position of the decimal point; it is not a significant figure.

400 This number has an accuracy of **one significant figure.**

Trailing zeros are often only place holders. In this number the zeros are there to show that the "4" is in the hundreds column. Since no decimal point is shown, the zeros have not been measured and are not significant.

Rules for Determining Significant Figures

1. **All non-zero digits** are significant.
2. **Zeros to the left of non-zero digits** are NEVER significant.
3. **Zeros between non-zero digits** are ALWAYS significant.
4. **Zeros to the right of non-zero digits** are significant ONLY if a decimal point is shown.

*Notice that the terms left, between and right refer to the placement of the zeros in relationship with non-zero numbers NOT in relationship with the decimal point.

All non-zero digits are always significant. The following examples illustrate the rules shown above as they apply to zeros:

rule 2		rule 3		rule 4	
number	sig figs	number	sig figs	number	sig figs
007	1	408	3	600	1
.025	2	7.002	4	8,500	2
0.09	1	30.7	3	30.0	3
.0081	2	50,009	5	46,000.	5

Problems

Indicate the number of significant figures and list the rules (by number) that apply to each.

	Sig figs	Rule		Sig figs	Rule
1. 247			9. 0.00007		
2. 0.3			10. 0.1002		
3. 200			11. 62.000		
4. 2.47			12. 3,000.		
5. 0.0074			13. 250		
6. 0.04030			14. 0.030		
7. 4,105			15. 1,200		
8. 8.00					

Multiplication and Division

When multiplying of dividing numbers you must count the number of significant figures in each number and round off the answer to the same number of significant figures as the least accurate number.

When Multiplying or Dividing
The answer must be rounded off to **the same number of significant figures** as the least accurate measurement used in the calculation.

Sample Problem 9 Multiply: (34.0) (.0921084)

Solution

Count significant figures ----------> 3 6

Calculator answer ----------> 3.1316856

Rounded to the correct accuracy ---------> **3.13**
(to 3 significant figures)

Sample Problem 10 Divide: $\frac{534.168}{.07}$

Solution

Count significant figures ----------> 6 / 1

Calculator answer ----------> 76.30971

Rounded to the correct accuracy ---------> **80**
(to 1 significant figure)

Problems

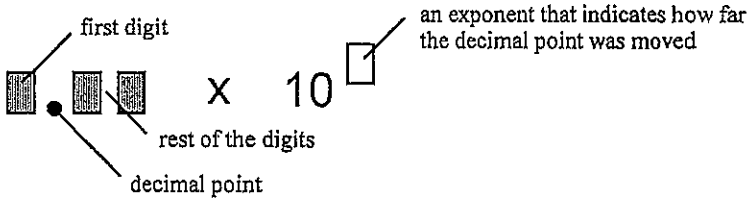
Label each number as to how many significant figures it contains. Write down your calculator answer and then the answer rounded to the correct accuracy.

	Sig figs	rounded answer
1. (16.00) (.617289)		
2. $\frac{65.431}{.003}$		
3. (.030040) (78.00000)		
4. $\frac{.8000}{.20}$		
5. (560) (.0031842)		
6. (0.050002) (406)		
7. $\frac{30.5}{.050817}$		
8. $\frac{128}{16}$		

Part III: Expressing Numbers that are Very large or Very Small

Scientific Notation

In the study of chemistry we often encounter numbers that are very large or very small. It is more convenient to work with these numbers if we express them in **scientific notation**. This means that we move the decimal point to a position immediately to the right of the first non-zero digit and use a power of ten to indicate how many places the decimal point has been moved. Thus any number expressed in scientific notation has the following format:



Remember that the decimal point **must** always end up immediately to the right of the first digit in scientific notation. Let's look at some numbers and see how they are converted to scientific notation.

regular form	scientific notation
3,500,000	3.5×10^{6}
400	4×10^{2}
18,500	1.85×10^{4}
.000062	6.2×10^{-5}
.007419	7.419×10^{-3}

Notice that... In scientific notation the first part is always a number between one and ten.

Notice that... In scientific notation the exponent of the power of ten indicates how many places the decimal point has been moved.

Notice that... If the original number was **large** (greater than one), the exponent is positive. If the original number was **small** (less than one), the exponent is negative.

In the last example above...

.007419

the decimal point is moved 3 places

Problems

Convert each number into scientific notation.

1. 23,000
2. .0045
3. 241
4. 14.9
5. .082
6. .92
7. 121.1
8. 40,000
9. .00016

Then get rid of the scientific notation and express each as a regular number.

10. 1.6×10^{-4}
11. 9.74×10^{7}
12. 4.088×10^{5}
13. 6.05×10^{-9}

Problems

Correct the following numbers in scientific notation.

14. $.85 \times 10^{5}$
15. 42×10^{8}
16. 16×10^{-4}
17. $.55 \times 10^{-23}$
18. $.7 \times 10^{4}$
19. $.036 \times 10^{8}$
20. 248×10^{-6}
21. $.6 \times 10^{2}$
22. 95×10^{-1}

Section 1: Express the following number using scientific notation

1) 10,000
2) 0.0001
3) 10,000,000,000
4) 50,000
5) 2,000,000,000
6) 0.0000004
7) 0.0003
8) 790,000
9) 26,000,000,000,000,000
10) 0.000000045
11) 48,000,000
12) 0.0000000000000000013
13) 0.0175
14) 0.0000462
15) 3,000,000
16) 9,200,000
17) 371
18) 0.00900
19) 0.62
20) 0.00197
21) 28
22) 134.2

Section 2: Write the following using standard notation

1. 1.00×10^{5}
2. 1×10^{-12}
3. 4×10^{2}
4. 5×10^{-6}
5. 3.2×10^{-2}
6. 4.95×10^{-1}
7. 7.95×10^{-1}
8. 14.3×10^{2}
9. 3.08×10^{-3}
10. 4.00×10^{-6}

Section 3: Carry out the following operations and express in scientific notation

1. 6000 x 0.004
2. 50 x 0.0000002
3. 800 / 40
4. 4000 / 80/500
5. 30,000 x 450,000
6. 0.006/ .02
7. 400/ 200,000
8. 0.00072 / 900,000
9. 0.0005 x 200 x 40,000,000
10. 0.049 – 0.00017
11. 450 + 250 + 75000
12. 0.000045 + .0008 / 35

Problems

Do each calculation as indicated. Make sure your answers are expressed in correct scientific notation.

23. $(2 \times 10^{3})(4 \times 10^{7})$
24. $(5 \times 10^{8})(7 \times 10^{7})$
25. $(7 \times 10^{-6})(8 \times 10^{-5})$
26. $(6.01 \times 10^{4})(3.0 \times 10^{-9})$
27. $(9.112 \times 10^{7})(4.56 \times 10^{-3})$

28. $(6.0 \times 10^{-5})(7.0 \times 10^{-6})(5.5 \times 10^{4})$

29. $(8.80 \times 10^{3})(6.65 \times 10^{-4})(5.5 \times 10^{5})$

30. $\dfrac{2 \times 10^{3}}{4 \times 10^{-5}}$

31. $\dfrac{8 \times 10^{-6}}{4 \times 10^{-3}}$

32. $\dfrac{3 \times 10^{8}}{2 \times 10^{6}}$

33. $\dfrac{1 \times 10^{-10}}{4 \times 10^{6}}$

Problems

Do each calculation as indicated. Make sure your answers are expressed in correct scientific notation.

34. $\dfrac{(6 \times 10^{3})(8 \times 10^{-5})}{(1 \times 10^{-2})(3 \times 10^{8})}$

35. $\dfrac{2 \times 10^{-8}}{(4 \times 10^{7})(2 \times 10^{5})}$

36. $\dfrac{(9 \times 10^{-7})(8 \times 10^{4})}{(3 \times 10^{5})(2 \times 10^{-3})}$

37. $\dfrac{(2 \times 10^{5})(3 \times 10^{-6})(5 \times 10^{8})}{(6 \times 10^{-7})(5 \times 10^{4})(2 \times 10^{3})}$

38. $\dfrac{(3 \times 10^{6})(4 \times 10^{3})}{(2 \times 10^{4})}$

39. $\dfrac{(2 \times 10^{-3})(8 \times 10^{-5})}{(4 \times 10^{-2})}$

40. $\dfrac{(5 \times 10^{6})(8 \times 10^{5})}{(4 \times 10^{-2})(2 \times 10^{-3})}$

41. $\dfrac{(6 \times 10^{-8})(7 \times 10^{3})}{(2 \times 10^{2})(3 \times 10^{-5})}$

Name:_____

WS 1.3 Significant Figures I **Chemistry: Chapter 1**

For the following measurements, indicate how many significant figures (sf's) there are:

1) 34 g ___ 2) 564 L ___ 3) 19.3 mm ___ 4) 23.45 mg ___ 5) 101 km ___

6) 3400 g ___ 7) 5040 L ___ 8) 19,000 mm ___ 9) 20 mg ___ 10) 160 km ___

11) 0.00034 g ___ 12) 0.564 L ___ 13) 0.0019 m___ 14) 0.5 mg ___ 15) 0.12 km ___

16) 34.0 g ___ 17) 56.40 L ___ 18) 19.00 m ___ 19) 20.0 mg ___ 20) 8.200 m ___

21) $34\overline{0}0$ g ___ 22) $2\overline{0}00$ L ___ 23) $14\overline{0}$ mm ___ 24) $190\overline{0}0$ mg ___ 25) $640\overline{0}$ km ___

26) 800 g ___ 27) 800. L ___ 28) 10,900 mm___ 29) 10.090 mg ___ 30) 803 km ___

31) 1,000,000 g___ 32) 1,000,001 g___ 33) 0.05060 m___ 34) 56 mg ___ 35) 0 m ___

Indicate the # of sig figs for the following:

36) 3.4×10^3 g ___ 37) 5.64×10^8L ___38) 7×10^{-5}mm___39) 2.4×10^4 g ___ 40) 3.61×10^2 m___

41) 3.0×10^3 g ___ 42) 5.60×10^8 L___43) 2.04×10^4 g___44) 6.00×10^2 g___ 45) 2.0×10^0 m ___

Convert between scientific notation and regular notation, without changing the number of sig fig's:

46) 5700 g = 5.7×10^3 g

47) 14,000,000 m = _____ m

48) 2,000 cm = _____ cm

49) 2,000. cm = _____ cm

50) 0.000043 kg = _____ kg

51) 0.000230 mg = _____ mg

52) 3.6×10^5 m = 360000 m

53) 3.6×10^{-5} m = _____ m

54) 3.60×10^5 m = _____ m

55) 6.00×10^1 kg = _____ kg

56) 6.00×10^2 kg = _____ kg

57) 3.25×10^3 L = _____L

Round each of the following off to the specified number of sig fig's: (some have been done for you...)

58) Round 78.241 g to... 4 sf: 78.24 3 sf: _____ 2 sf: _____ 1 sf: _____

59) Round 4.2983 g to... 4 sf: _____ 3 sf: 4.30 2 sf: _____ 1 sf: _____

60) Round 373.99 g to... 4 sf: _____ 3 sf: _____ 2 sf: 370 1 sf: _____

61) Round 50,001 g to... 4 sf: _____ 3 sf: _____ 2 sf: _____ 1 sf: 50,000

Name:_____

WS 1.4 Significant Figures II **Chemistry: Chapter 1**

1) Review: Indicate how many sig figs are in each of the following measurements:

a) 34.0 cm___ b) 61400 g___ c) 0.002030 sec___ d) 6.35×10^4 L___ e) 4.0×10^{-5} kg___

2) Perform all calculations and express your answer with the appropriate sig figs & units:

a) 67 cm x 55 cm = 3700 cm^2 b) 4.29 m x 9.83 m = _____ c) 870 mm x 430 mm = _____

d) 0.034 g/L x 8.8 L = _____ e) 5.79 m/hr x 2.34 hr = _____ f) 1.405 m x 6.39 m = _____

g) 5.00 cm x 6.00 cm = _____ h) 5.6 m^2 x 6.23 m = _____ i) 5.471 g/mL x 24.0 mL = _____

j) 45.9 mi ÷ 1.50 hr = _____ k) 320 m ÷ 160 sec = _____ l) 234.6 g ÷ 67.4 mL = _____

m) 36.2 cm ÷ 4 min = _____ n) 3.45 L ÷ 19 sec = _____ o) 8.90 lb ÷ 1730 days = _____

p) 3.56 cm x 2.45 cm x 0.83 cm = _____ q) 3.56 g ÷ (2.6 cm x 4.3 cm x 7.8 cm) = _____

3) Perform all calculations & express your answers with appropriate place-value & units:

a) 67 cm + 45 cm = _____ b) 4.29 m + 9.83 m = _____ c) 170 mm + 250 mm = _____

d) 6.74 g + 2.1 g = _____ e) 1200 kg + 286 kg = _____ f) 13.531 sec + 4.1 sec = _____

g) 7800 cm - 2 cm = _____ h) 784.326 m - 2 m = 782 m i) 2.54 g - 0.000034 g = _____

j) 72$\overline{0}$ kg - 34.2 kg = _____ k) 45230 mL - 230 mL = _____ l) 3.567 m - 0.067 m = _____

4) A box is 235.8 cm by 45.2 cm by 7.9 cm. Its volume (V = l x w x h) is: _____

5) A 934 g cat ate a 82.4 g rat, and then coughed up a 3.672 g hair ball. The cat now weighs: _____

6) A 5627 g brick measures 5.60 cm x 4.51 cm x 24.71 cm. Its density (D=m/V) is: _____

7) A car travels a distance of 450 km in a time of 3.42 hrs. Its average velocity (v = d/t) is: _____

8) A 45.67 g stone is place in a grad. cylinder, and the liquid level rises from 25.7 mL to 32.6 mL. Determine the stone's density: _____ (hint: Density = mass ÷ volume displacement)

9) A 65 kg man is losing weight at the rate of 0.3612 kg/week. After 7.24 weeks, he will weigh: ____

ANS (IRO+1): 0.00514 0.041 0.18 0.30 2 2.0 2.54 3 3 3 3.48 3.500 4 6.6 7.2 8.8 8.98 9 9.02 13.5 14.12 17.6 30.0 30.6 35 42.2 62 112 130 131 420 686 1013 1500 7800 45$\overline{0}$0 84000 100120 370000

UNITS (IRO+1): g g g g g kg kg kg m m m cm cm mm m^2 m^2 cm^2 mm^2 m^3 cm^3 cm^3 g/cm^3 g/cm^3 g/mL g/mL L/sec cm/min km/hr sec hr mL m/sec mi/hr lb/day

Converting Single Measurements

One useful application of dimensional analysis is converting measurements in either the English or Metric system. Most of us can do simple one step conversions, like feet to inches, by pure logic. But when several steps are involved, such as to convert miles to inches, use dimensional analysis.

Sample Problem 2 How many meters are in 2.5 yards?

Solution To solve this problem we will need to recall certain equivalencies which should be familiar to you. A partial list of these equivalences are on the next page. A more complete list is contained in the appendix of this book. It is best to decide a path through the problem by picking out the appropriate equivalencies in the appropriate order before starting to set up the problem. Since we are starting with yards and have to convert to meters these equivalencies are:
1 yard = 3 feet, 1 foot = 12 inches, 1 inch = 2.54 centimeters, and 1 meter = 100 centimeters.

Step 1 Convert the 2.5 yards to feet by multiplying by "3 feet over 1 yard". Hold off on the actual multiplication until the whole problem is set up.

$$2.5\ \text{yd} \times \frac{3\ \text{ft}}{1\ \text{yd}}$$

Step 2 Convert feet to inches by multiplying by "12 inches over 1 foot".

$$2.5\ \text{yd} \times \frac{3\ \text{ft}}{1\ \text{yd}} \times \frac{12\ \text{in}}{1\ \text{ft}}$$

Step 3 Convert inches to centimeters by multiplying by "2.54 centimeters over 1 inch".

$$2.5\ \text{yd} \times \frac{3\ \text{ft}}{1\ \text{yd}} \times \frac{12\ \text{in}}{1\ \text{ft}} \times \frac{2.54\ \text{cm}}{1\ \text{in}}$$

Step 4 Convert centimeters to meters by multiplying by "1 meter over 100 centimeters". This process has forced us to arrange the numbers in a particular fashion to custom build a formula for this problem. At this point you can use your calculator to get the answer: 2.3 meters.

$$2.5\ \text{yd} \times \frac{3\ \text{ft}}{1\ \text{yd}} \times \frac{12\ \text{in}}{1\ \text{ft}} \times \frac{2.54\ \text{cm}}{1\ \text{in}} \times \frac{1\ \text{m}}{100\ \text{cm}} = \square\ \text{m}$$

English and Metric Conversion Table

12 inches = 1 foot 3 feet = 1 yard 16.5 feet = 1 rod 5280 feet = 1 mile 40 rods = 1 furlong 6 feet = 1 fathom	1 kilometer = 1000 meters 1 hectometer = 100 meters 1 decameter = 10 meters 10 decimeters = 1 meter 100 centimeters = 1 meter 1000 millimeters = 1 meter
1 gallon = 231 inch^3	1 milliliter = 1 centimeter^3
16 ounces = 1 pint 2 pints = 1 quart 4 quarts = 1 gallon	1000 milliliters = 1 liter
1 mole = 6.02×10^{23} atoms/molecules 1 mole = 22.4 Liters 1 mole = ____ grams	English to metric conversion: 2.54 centimeters = 1 inch

Problems Use only the conversion factors listed in the above table.

1. How many rods will equal 247 inches?

2. How many centimeters in 34.2 decimeters?

3. A horse race is 55.0 furlongs. How many yards is that?

4. How many ounces are in 1.00 gallon?

5. A "Five K Race" is 5.00 kilometers long. How many miles is that?

6. How many fathoms are in 63 decameters?

7. How many rods in 26 miles?

8. How many cm in 1.0 mile?

9. Hiking trails are often marked on maps in rods. How many kilometers long is a trail marked as 82 rods on the map?

10. How many hectometers are in 56 furlongs?

Name : _____ Score : _____

Teacher : _____ Date : _____

Converting Between Metric Units

1) 19.33 m to cm _____

2) 479,100 cm to m _____

3) 7.78 m to mm _____

4) 98,800 mm to m _____

5) 5.84 km to m _____

6) 389,300 m to km _____

7) 81.18 cm to mm _____

8) 1,379 mm to cm _____

9) 54.32 km to cm _____

10) 855,300 cm to km _____

11) 57.12 km to mm _____

12) 71,919 mm to km _____

13) 64.07 g to mg _____

14) 2,559 mg to g _____

15) 7.76 kg to mg _____

16) 719,400 mg to kg _____

17) 40.44 kg to g _____

18) 6,330 g to kg _____

19) 8.29 m to cm _____

20) 5,128,900 cm to m _____

Converting mm, cm, m and km (A)

Convert each measurement to the unit indicated.

0.000061 m to mm

0.0752 m to mm

37,200 cm to m

670 cm to km

4.31 cm to m

0.000000185 km to cm

0.059 km to m

6.71 km to m

40,400 cm to m

0.0000224 km to cm

0.0000003 km to cm

25,600,000 mm to km

3,370,000 m to km

82,000 cm to m

0.0013 km to cm

4.5 m to mm

0.0223 m to mm

71.3 cm to mm

8,150,000 mm to km

0.0000424 m to mm