Name: _____

Period: _____

Chemistry 11

Determining Significant Zeros

Directions: Determine the number of significant figures in the following numbers.

1. 1,000 1
2. 1250 3
3. 45068 5
4. 120,360 5
5. 9.670 4
6. 1.02560 6
7. 1025.6540 8
8. 102,300 4
9. 160 2
10. 140.3 4
11. 0.00015 2
12. 0.102400 6
13. 12.00 4
14. 3.0025 5
15. 5.6980012 8
16. 0.4158900 7
17. 2.36901 6
18. 0.002 1
19. 909 3
20. 10.0 3
21. 10 1
22. 10.1010 6
23. 5.87400 6
24. 0.321000 6
25. 12.3600 6
26. 1.2005 5
27. 0.012 2
28. 0.36900 5
29. 5.4700 5
30. 1,000,200 5
31. 1,000,000 1
32. 1,000,001 7
33. 8.5600 5
34. 0.320020 6
35. 1.203600 7
36. 78.985600 8
37. 7963.2504 8
38. 7900.1003 8
39. 7.9805 5
40. 0.00015603 5
41. 0.01236500 7
42. 1.000125 7
43. 4.69003 6
44. 1.0024500 8
45. 7.96300 6
46. 1,569,000 4
47. 5.10 3
48. 56.3600 6
49. 79.6003 6
50. 8.230014 7
51. 0.02 1
52. 0.020 2
53. 0.002000 4
54. 0.00200503 6
55. 1.003 4
56. 1,003,900 5
57. 7.986 4
58. 8.9653 5
59. 5.63201 6
60. 0.0236500 6
61. 4.25600 6
62. 1.0023650 8
63. 4,560,000 3
64. 956,000,000 3
65. 5.639000 7
66. 654.01200 8
67. 9.600 4
68. 8.00 3
69. 9.6358 5

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Chemistry 11

Significant Figures Worksheet

A: Write the number of significant figures in the space provided.

B: Write the numbers from part A in scientific notation.

	A	B
1.) 12 345	5	1.2345×10^{4}
2.) 0.24589	5	2.4589×10^{-1}
3.) 1 000	1	1×10^{3}
4.) 0.02356	4	2.356×10^{-2}
5.) 745 256 568	~~8~~ 9	7.45256568×10^{8}
6.) 0.000 004	1	4×10^{-6}
7.) 0.024	2	2.4×10^{-2}
8.) 1 001	4	1.001×10^{3}
9.) 10 234	5	1.0234×10^{4}
10.) 0.000 000 000 7	1	7×10^{-10}
11.) 789 000	3	7.89×10^{5}
12.) 100.123	6	1.00123×10^{2}
13.) 0.030 45	4	3.045×10^{-2}
14.) 0.456 897	6	4.56897×10^{-1}
15.) 125 000 000	3	1.25×10^{8}
16.) 785.325	6	7.85325×10^{2}
17.) 0.000 000 000 000 001	1	1×10^{-15}
18.) 12.23	4	1.223×10^{1}
19.) 780	2	7.8×10^{2}
20.) 6,235,000	4	6.235×10^{6}

X

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C: Round off the following to the # of sig fig's in the brackets

1.) 12 345 (3) 12300

2.) 0.24589 (4) 0.2459

3.) 293 (2) 290

4.) 0.02356 (2) 0.024

5.) 745 256 568 (5) 745260000

6.) 0.000 004 356 (3) 0.000 00436

7.) 0.024 (1) 0.02

8.) 1 001 (1) 1000

9.) 10 234 (3) 10200

10.) 0.000 725 (2) 0.000 73

11.) 789 000 (2) 790 000

12.) 100.123 (4) 100.1

13.) 0.030 45 (3) 0.0305

14.) 0.456 897 (5) 0.45690

15.) 125 000 000 (2) 130 000 000

16.) 785.325 (4) 785.3

17.) 0.000 000 000 168 (2) 0.000 000 000 17

18.) 12.23 (2) 12

19.) 780 (1) 800

20.) 6,235,000 (2) 6200000

D: Write in scientific notation with the correct # of sig fig's

1.) 1.23×10^{4}

2.) 2.459×10^{-1}

3.) 2.9×10^{2}

4.) 24×10^{-2}

5.) 7.4526×10^{8}

6.) 4.36×10^{6}

7.) 2×10^{-2}

8.) 1×10^{3}

9.) 1.02×10^{4}

10.) 7.3×10^{-4}

11.) 7.9×10^{5}

12.) 1.001×10^{2}

13.) 3.05×10^{-2}

14.) 4.569×10^{-1}

15.) 1.3×10^{8}

16.) 7.853×10^{2}

17.) 1.68×10^{-10}

18.) 1.2×10^{1}

19.) 8×10^{3}

20.) 6.2×10^{6}

X

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Chemistry 11

Unit Conversion Worksheet

Directions: Read each question carefully and solve using the procedure discussed in class. Be sure to show all your work.

1. Retired quarterback, Drew Bledsoe, needs to buy some donuts for the team practice. If a dozen donuts cost $3.25, how much will it cost for 8 dozen?

$$8 \text{ dozen} \times \frac{\$3.25}{1 \text{ dozen}} = \$26.00$$

2. Mr. Simms loves to spend time playing (carefully!) with chemicals. He needs to order some chemicals for his latest and greatest experiment. The chemical he needs costs $15.50/gram. How much will it cost to order 25 grams?

$$25 \text{ g} \times \frac{\$15.50}{1 \text{ g}} = \$387.50$$

3. Mr. Eckert needs to have multiple coffees every day. If he spends a $3.60 each day at Tim Horton's, how much will he spend after one school week (5 days)?

$$5 \text{ days} \times \frac{\$3.60}{1 \text{ day}} = \$18.00$$

4. Daniel Sedin of the Vancouver Canucks is averaging 3 points per game. How many games will he have to play in order to reach 81 points?

$$81 \text{ points} \times \frac{1 \text{ game}}{3 \text{ points}} = 27 \text{ games}$$

5. Ms. Johnson has to go to the store and buy some candy. If the candy costs $1.10 per 100 grams, how much will 650 grams cost?

$$650 \text{ g} \times \frac{\$1.10}{100 \text{ g}} = \$7.15$$

6. Mr. Simms has to drive all the way to Chilliwack to pick up some chemicals for a science experiment. If his car gets 7.8 km/L of gas, how much gas will he need to travel the 55 km to Chilliwack?

$$55 \text{ Km} \times \frac{1 \text{ L}}{7.8 \text{ Km}} = 7.1 \text{ L of gas.}$$

Name: _____ Block: _____

7. Ms. Matheson needs to buy some chemicals for the chemistry department, however the order is coming from the United States and she has to figure out the cost in Canadian dollars. If the order costs $85.96 US how much will it be in Canadian dollars? The current exchange rate is 1.05. (That means 1 US dollar equals 1.05 Canadian dollars)

$85.96 USD × $1.05 CND / $1 USD =

8. Mr. Simms enjoys running. His fastest time for running the mile is 7.0 minutes. How fast did he run in miles per hour?

1 mile / 7 min × 60 min / 1 h = 8.57 mph

9. Sugar costs $0.980/kg. 1 t = 1000 kg. How many tones ('t') of sugar can you buy for $350?

$350 × 1 kg / $0.980 × 1 ton / 1000 kg = 3.57 × 10⁻¹ tones

10. The Cullinan diamond, the largest diamond ever found, had an uncut volume of 177mL. If 1 mL of diamond has a mass of 3.51g and 1 carat = 0.200g, how many carats was the Cullinan diamond?

177 mL × 3.51 g / 1 mL × 1 carat / 0.200 g = 3106.35 ↪ 3110 carats

11. An ancient Celtic chicken farmer wished to purchase a gift for his wife. The gift was worth 2 horses. At the local market, 3 horses were worth 5 cows, 1 cow was worth 4 hogs, 3 hogs were worth 4 goats, and 1 goat cost 9 chickens. How much was the gift going to cost the farmer, who had to pay in chickens?

1 gift × 2 horses / 1 gift × 5 cows / 3 horses × 4 hogs / 1 cow × 4 goats / 3 hogs × 9 chickens / 1 goat = 160 chickens

12. How many kilometers ('km') will a car traveling at 120 km/h go in:

(a) 0.25 h

0.25 h × 120 km / 1 h = 30 km

(b) 12 min

12 min × 1 h / 60 min × 120 km / 1 h = 24 km

Name: _____ Block: _____

13. If 1 yard = 3 feet, 1 foot = 12 inches and 1 centimeter = 0.3937 inch, how many centimeters are there in 5 yards?

$$5 \text{ yards} \times \frac{3 \text{ feet}}{1 \text{ yard}} \times \frac{12 \text{ inch}}{1 \text{ foot}} \times \frac{1 \text{ cm}}{0.3937 \text{ inch}} = 457.2 \text{ cm}.$$

14. Solve the following, using the fact that beakers cost $8.40 per dozen.

a. Harry drops 3 dozen beakers. How much will Mr. Simms charge Harry?

$$3 \text{ dozen} \times \frac{\$8.40}{1 \text{ dozen}} = \$25.20.$$

b. Harry drops another 5 dozen beakers (clumsy!). If Burger Bob's hamburgers cost $1.50 each, how many hamburgers could clumsy Harry have bought for the same amount of money, as he has to pay for the second batch of beakers?

$$5 \text{ dozen} \times \frac{\$8.40}{1 \text{ dozen}} \times \frac{\text{burger}}{\$1.50} = 28 \text{ burgers}.$$

c. Harry does not learn very quickly, and breaks a third batch of beakers. If he has to pay $13.30, what is the number of beakers he breaks the third time? (Express your answer in actual numbers of beakers, rather than in 'dozens of beakers'.)

$$\$13.30 \times \frac{\text{dozen}}{\$8.40} \times \frac{12}{1 \text{ dozen}} \approx 19 \text{ beakers}$$

15. ***Light travels at a rate of 3.00 x 10^8 m/s.*** It takes light 8.3 min to travel from the surface of the sun to the earth. What is the distance of the earth from the sun?

$$8.3 \text{ min} \times \frac{60 \text{ s}}{1 \text{ min}} \times \frac{3.00 \times 10^8 \text{ m}}{1 \text{ s}} = 1.49 \times 10^{11} \text{ m}.$$

16. The moon is 3.8 x 10^5 km from the earth. What time will pass between the instant an astronaut on the moon speaks and the instant the voice is heard on earth? (His voice travels by modulated laser beam at the speed of light).

$$3.8 \times 10^5 \text{ km} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ s}}{3.00 \times 10^8 \text{ m}} = 1.265 \text{ s}.$$

↳ 1.3 s.

Y

Name: _____ Block: _____

17. A robot vehicle is traveling on the surface of Mars while Mars and Earth are at their closest approach (7.83×10^7 km). Suddenly, a video camera on the robot shows a yawning crevasse dead ahead! How many minutes will it take for an electronic signal traveling at the speed of light to go from Earth to Mars in order to tell the robot to stop immediately?

$$7.83\times10^{7}\,km \times \frac{1000\,m}{1\,km} \times \frac{1\,s}{3.0\times10^{8}\,m} \times \frac{1\,min}{60\,s} = 4.35\,min.$$

18. Convert 267, 000 mm to km

$$267{,}000\,mm \times \frac{1\,m}{1000\,mm} \times \frac{1\,km}{1000\,m} = 2.67\times10^{-1}\,km$$

19. Convert 1,200,900 μm to m

$$1200900\,\mu m \times \frac{10^{-6}\,m}{1\,\mu m} = 1.2009\,m.$$

20. Jacob Simms is a 2nd degree black belt in Taekwondo and can perform amazingly fast back round kicks. If he can do 5 kicks in 3 seconds, how many kicks can he do in 2 hours?

$$2h \times \frac{60\,min}{1\,h} \times \frac{60\,s}{1\,min} \times \frac{5\,kicks}{3\,s} = 12{,}000\,kicks$$

21. Mrs. Simms loves chai tea lattes from Starbucks. If she drinks one latte a day, at a cost of $4.85, how much will she spend per month? (Assume 30 days in a month). How much in a year?

$$30\,days \times \frac{\$4.85}{1\,day} = \$145.5 \qquad 365\,days \times \frac{\$4.85}{1\,day} = \$1770.25$$

22. What number comes after 7?

8