

Math Skills Pre-Test A

Overall Score _____ (27 possible)

Name Tc7

Percentage _____

Date _____ Period _____

Chemistry requires the use of some math skills. This pre-test is for you to find out what you know and what you need work on. The problems are designed to be do-able without a calculator. A **high** score on this pre-test indicates that you have the math skills needed for high school chemistry. An **average** score on this pre-test means that you have the math skills needed for high school chemistry, but you will need to work extra hard on the math concepts. A **low** score means that you will likely need to work extra hard and come in for help from your teacher fairly often. The overall score will not affect your class average.

Solve for the variable or number, unless otherwise indicated. Show work as needed. Please write each answer in the blank provided.

A. Solving Equations Using Addition and Subtraction

1. $x + 2 = 9$ $x = 7$
 $\begin{array}{r} x + 2 = 9 \\ -2 \quad -2 \\ \hline x = 7 \end{array}$

2. $m - 31 = 12$ $m = 43$
 $\begin{array}{r} m - 31 = 12 \\ +31 \quad +31 \\ \hline m = 43 \end{array}$

B. Solving Equations Using Multiplication and Division

3. $4p = 16$ $p = 4$
 $\begin{array}{r} 4p = 16 \\ \div 4 \quad \div 4 \\ \hline p = 4 \end{array}$

4. $(y/2) = 5 \times 2$ $y = 10$
 $\begin{array}{r} (y/2) = 5 \times 2 \\ \times 2 \quad \times 2 \\ \hline y = 10 \end{array}$

C. Solving Equations using add/subtraction/multiplication/division.

5. $4x - 7 = 37$ $x = 11$
 $\begin{array}{r} 4x - 7 = 37 \\ +7 \quad +7 \\ \hline 4x = 44 \\ \div 4 \quad \div 4 \\ \hline x = 11 \end{array}$

6. $5 + z/2 = 9$ $z = 8$
 $\begin{array}{r} 5 + z/2 = 9 \\ -5 \quad -5 \\ \hline z/2 = 4 \\ \times 2 \quad \times 2 \\ \hline z = 8 \end{array}$

D. Using integers in calculations

7. $23 + (-7) = 16$

8. $11 - (-11) = 22$

9. $(-6) \cdot (-7) = 42$

10. $(5/2) \cdot (-6/5) = -3$

E. Solving formulas for a variable :

Rearrange each formula as instructed.

11. $PV = nRT$ solve for T

$T = \frac{PV}{nR}$

12. $P_T = P_1 + P_2 + P_3$ solve for P_2

$P_2 = P_T - P_1 - P_3$

13. $d = \frac{m}{v}$ solve for V

$v = \frac{m}{d}$

$\frac{d}{1} = \frac{m}{v} \Rightarrow \left(\frac{m}{1}\right) \frac{1}{d} = \frac{v}{v} \left(\frac{m}{1}\right) \Rightarrow v = \frac{m}{d}$

F. Conversions

14. How many milligrams (mg) of mercury would be contained in 10 thermometers if each thermometer contains 1.24 mg of mercury?

$$\left(\frac{10 \text{ therm.}}{1} \right) \left(\frac{1.24 \text{ mg}}{1 \text{ therm.}} \right) = 12.4$$

12.4 mg

15. The answer to the following problem would be expressed in units of:

$$\frac{60 \text{ s}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{24 \text{ hr}}{\text{day}} \times \frac{365 \text{ days}}{\text{yr}} = 31\,536\,000 \text{ sec/year}$$

G. Proportions: Solve for the variable

$$16. \frac{x}{30} = \frac{3}{10}$$

$$x = 9$$

$$17. \frac{2}{30} = \frac{6}{j}$$

$$j = 90$$

H. Percentage

18. Anita's chemistry test had 40 problems. She answered 30 of them correctly. What percent of the problems did she answer correctly?

$$\frac{30}{40} = \frac{3}{4} = 75\%$$

75%

19. Billy had 80% on a test that had a total of 50 points. How many points did he earn?

$$80\% (50) = 40$$

40 points

I. Scientific notation: (example: 1.00×10^4)

Change to scientific notation:

$$20. 234.5$$

$$2.345 \times 10^2$$

$$21. 0.000987$$

$$9.87 \times 10^{-4}$$

Change to a regular number:

$$22. 6.54 \times 10^5$$

$$654,000$$

$$23. 2.34 \times 10^{-3}$$

$$0.00234$$

J. Number sense: Fractions \leftrightarrow decimals

Give the equivalent values for the most common fractions/decimals:

$$24. 0.1 = \frac{1}{10}$$

$$25. 0.25 = \frac{1}{4}$$

$$26. 1/100 = 0.01$$

$$27. 2/5 = 0.4$$

After taking the pre-test, make an evaluation of your own math skills.

Self-Evaluation: Excellent Good OK Not so good Real bad