Unit 1 Assessment Study Guide

Directions: *Please answer each question on a separate sheet of paper. Remember to show all work.*

1. John received 425 votes in a school election. If he received 125 more than $\frac{3}{4}$ of the total number of votes, how many students voted in the election?

2. A radio station charges an initial fee for broadcasting advertisements plus a rate based on the length of the advertisement in seconds. The table below shows the total charges for advertisements of different lengths.

Advertisements

Length of Advertisement (seconds)	Total Charge
15	$225
30	$270
60	$360

Write an equation to represent the linear relationship between n, the length in seconds of an advertisement and c, the total charge of the advertisement?

3. Cliff needs to buy chicken and brats for a picnic. He has only $25.50 to spend and must buy at least 40 chickens or brats. A store charges $.50 per chicken and $0.25 per brat. Which of the following is a possible way Cliff might buy the hamburgers and hot dogs?

   i.   43 chickens and 15 brats
   ii.   38 chickens and 24 brats
   iii. 45 chickens and 13 brats
   iv.   52 chickens and 10 brats

4. What is the sum of the coefficients of the expression $2x^4 + 5y^3 - 7z^2 + 5$?

5. In order to be admitted for a certain ride at an amusement park, a child must be greater than or equal to 36 inches tall and less than 48 inches tall. Create a graph to represent these conditions?

6. Brianna had 5 rolls of dimes and 3 extra dimes. She used the equation $n = 5d + 3$ to find n, the number of dimes she had altogether. Rewrite this equation so she can use it to find d, the number of dimes in each roll?

7. A rectangle has a length of 15m and a width of 200cm. What is the perimeter of the rectangle?

8. Using the formula $F = \frac{9}{5}C + 32$ and solve for **C**.

9. Solving the interest formula, $I = prt$, for the variable p will result in what equation?

10. Jesse wanted to investigate a situation where he would put stones around his existing shrubbery. What quantities should he consider in this situation?
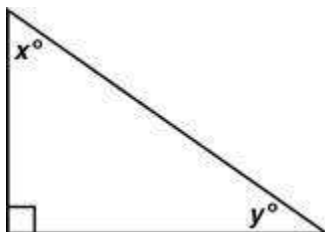
11. The measures of the acute angles of the right triangle below are represented by x and y. In this triangle, y is 15 less than twice x.

Which system of equations could **NOT** be used to solve for x and y?

A. $x + y = 90$
   $2x - 15 = y$

B. $x + y + 90 = 180$
   $2x - 15 = y$

C. $x + y = 90$
   $\frac{y+15}{2} = x$

D. $x + y + 90 = 180$
   $2y - 15 = x$

12. The formula for determining the kinetic energy, k, of an object with mass, m, moving at velocity, v, is shown.
$$k = \frac{1}{2}mv^2$$

Write an equivalent equation to this formula when solved for the mass, v^2?

13. A salesperson earns a weekly base salary plus a commission of 10% of all sales over the first $400. This situation can be represented by the expression $750 + 0.1(x - 400)$

   i. What does 750 represent in this situation?
   ii. What does $0.1(x\text{-}400)$ represent in this situation?

14. Yvonne took 4 math tests. She earned grades of 84, 88, and 92 on the first 3 tests. Her mean (average) grade for the 4 tests was 90. Write an equation which can be used to determine her grade G on the 4th test?

**15.** Draw a line from each length to the appropriate unit of measure.

   i. Diameter of the head of a nail
   ii. Length of a cat's tail
   iii. Distance around a high school track
   iv. Height of a wall in a house

   A. meters
   B. centimeters
   C. millimeters
   D. yards

16. Gale wants to buy some new clothes, but she cannot afford more than $95 before the sales tax is added. The blouses she wants are priced $16 each and the pants she wants are priced $23 each. Write an inequality to be used to determine b, the number of blouses, and p, the number of pants Gale can afford?

17. Spencer makes a $75 down payment, and then makes $45 monthly payments on a computer he purchased. Write an equation to represent this situation, let y equal the total amount he paid for the computer.

18. The graph of a function is shown to the right.

Describe a situation of the graph that would be appropriate
for the variable *y*?

Time
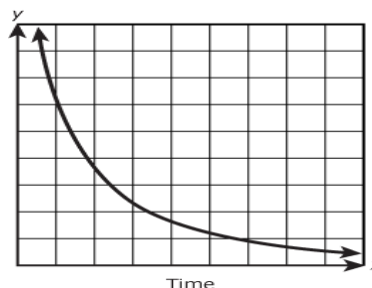
19. Look at the expression below.
$$5x^2 - 4x + 3$$

    i.   Name the term(s) of this expression.

    ii.   Name the coefficient(s) of this expression.

    iii.   Name the constant(s) of this expression.

    iv.   True or False: 2 is the exponent of the term *5x*.

20. The Cross Country Team is sponsoring a bake sale. If their goal is to raise *at least* $700, how many cakes must
they sell at $4.00 each in order to meet that goal?

    i.   Write an inequality that represents this situation.

    ii.   How many cakes must they sell in order to meet their goal?

    iii.   Graph an inequality to represent this solution.

21. This expression is a product.
$$2(8a + b)(\text{-}2c + 8)$$

    i.   As written, how many factors make up this product?

    ii.   What are they?

22. Your step-sister is a college freshman. She has 700 problems to do for homework in 70 days. She plans to
complete 10 problems a day until she is finished with all of them.   You want to create a graph to show her how
many problems she has remaining after each day. Determine a scale for the x-axis and y-axis to see the remaining
number of problems each day until they are all complete.

    Sketch a graph which includes the following:

    i.   *Labels for each axis*

    ii.   *An appropriately labeled scale for each axis as determined by the information given.*

23. Water is coming from the blowhole of a whale and the eruption follows a parabolic path. The height, *h,* in feet of
the water, *t,* seconds after it is ejected from the blowhole is given by the equation, *h(t)= -16t² + 64t + 936*. After 5
seconds the water reaches its maximum height. What is the maximum height of the water?

24. Bruno owns a business that produces wackadoodles. He must bring in more in revenue than he pays out in costs in
order to turn a profit.

- It costs $20 in labor and materials to make each of his wackadoodles.
- His rent each month for his factory is $2000.
- He sells each wackadoodle for $40.

How many wackadoodles does Bruno need to sell each month to make a profit? How do you know?

25. When Julia buys an item from a catalog, the total amount she pays is made up of the following three amounts of money:

- the price of the item
- sales tax of 7% of the price of the item
- a fixed shipping fee that is always the same regardless of the cost or size of the order

Julia bought a pair of shoes with a price of $120 from the catalog.

- **i.** What was the sales tax, in dollars, that Julia paid on the shoes?
- **ii.** The total amount, including the sales tax and the shipping fee, that Julia paid for the shoes was $140. What was the shipping fee, in dollars?
- **iii.** Suppose the shipping fee is $15. If Julia bought an item with a price of $300 from the catalog, with a sales tax of 5%, what is the total amount she paid, in dollars, including the sales tax and the shipping fee?

26. The Joker family has half as many pepper plants as tomato plants. Using the graph below, if there are 21 plants in their garden, how many plants are tomato plants? How do you know?

Number of Tomato and Pepper Plants
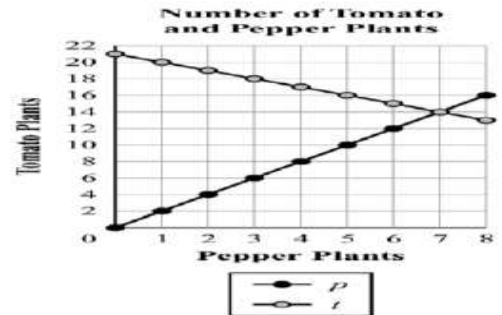
27. A biology teacher asked four of his students to measure the distance that a caterpillar crawled over a period of three nights.

**Caterpillar's Crawl Results**

Recorded Length (in cm)
10.1
7.38
15.002
6.07

Each student rounded the measurement to a different decimal place and reported the findings shown below.

The teacher calculated a sum that represented the precision of the students' measurements. What sum should the teacher have calculated?

28. Four students in art class measured the length of a piece of paper needed for a project. They used a measuring tape with scale increments like those shown.

Measuring Tape
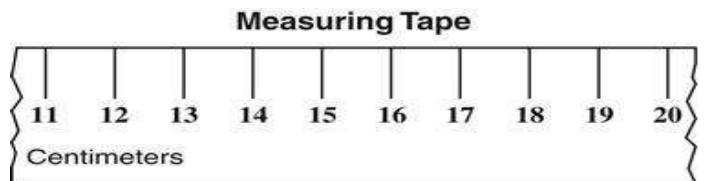
The result of the student measurements are shown in the table.

Which student's measurement is the most accurate to use, based on the tape used?

Student Measurements

Student	Measurement
L	14 cm
M	14.2 cm
N	14.33 cm
P	14.45 cm