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Algebra 1

Weekly Skills Assessment #8

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Directions: Complete all problems in this packet to prepare for **EXPLORE.** You MUST show all work on each problem in order to earn credit. All answers should be written in simplest form.

This packet counts as ¼ of a summative assessment for quarter 3.

It is due on: **Friday, January 30** *(late packets will not be accepted)*

\* Remember that you have 1 week to complete the packet. If you need help, please see Mr. Kueppers or Mrs. Zaborowski for assistance, but do not wait until the last minute (Thursday afternoon or Friday morning) to do so.

This week, your skills assessment will focus on reviewing the major Pre-Algebra concepts you will need to know for EXPLORE. Use the short explanations of each of these concepts below to answer the questions that follow.

Topic #1: ***Number Systems***

On the EXPLORE, number problems are word problems that ask you to manipulate number systems. The math in number problems is usually extremely simple, but the number problems can be confusing because of their wording and because of the multiple steps involved in answering them. The first step in answering these questions is to read carefully and make sure you know exactly what they are asking. Important vocabulary you may need to remember for this type of problems include:

* **Rational numbers**: Integers, decimals (terminating or repeating), and fractions.
* **Irrational numbers**: Numbers that cannot be written as fractions or decimals because there is no recurring pattern of digits within the number.
* **Real numbers**: The set of all rational and irrational numbers.
* **Prime number**: A whole number greater than 1 that has only two factors, itself and 1.
* **Composite number**: A whole number that is not a prime number.
* **Factors**: Numbers that are multiplied together to obtain a product.
* **Multiple**: The product generated when a number is multiplied by an integer.
* **Greatest Common Factor**: The largest number that is a factor of two or more numbers.
* **Least Common Multiple**: The lowest multiple that two particular numbers share.
* **Absolute Value**: The distance of a number from zero on the number line.

Topic #2: ***Order of Operations and Exponents***

You will need to know and use the order of operations for the EXPLORE test. The best way remember which operation is performed before another is the acronym **PEMDAS,** which stands for parentheses, exponents, multiplication and division (from left to right), and addition and subtraction (from left to right).

Remember that an exponent is a superscript number placed next to another number at the top right. It indicates how many times the base number is to be multiplied by itself. Exponents provide a shorthand way to write what would be a longer mathematical expression.

For example, a2 = a \* a or 24 = 2 \* 2 \* 2 \* 2

A negative exponent is the same as the reciprocal of a positive exponent.

For example, a-2 = 1/a2

Topic #3: ***Fractions, Decimals, Percent, Ratios, and Proportions***

Percentage problems appear frequently on EXPLORE. Because percentages are essentially fractions and decimals, knowing how to work with fractions and decimals will aid in your understanding of the common questions about percentages. Important concepts that you should remember include:

* A fraction is a number that is expressed as one integer written about another integer. The top of the fraction is the “numerator” and the bottom of the fraction is the “denominator.”
* To express a percentage as a fraction, divide the percentage number by 100 and reduce the fraction to its simplest form.
* To convert a decimal to a percentage, move the decimal point two places to the right.
* To convert from a percent to a decimal, move the decimal point two places to the left.
* A ratio is a comparison of two quantities in a particular order.
* A proportion is a relationship between two quantities that dictates how one changes when the other changes.
  + A direct proportion describes a relationship in which a quantity increases by a set amount for every increase in the other quantity, or decreases by the same amount for every decrease in the other quantity.
  + An inverse proportion is a relationship in which an increase in one quantity is accompanied by a decrease in the other, or vice versa.

Part 1 Practice Problems: ***Basic math problems that should be quick and easy to complete with a calculator* (1/2 point per problem)**

1. What is the remainder when 189,540 is divided by 27?
2. What is the fifth term in the arithmetic sequence 21, 17, 13, 9,……?
3. What is the next-highest prime number after 67?
4. Which digit in the number 1,234.56789 is in the thousandths position?
5. Which of the following numbers is the greatest: -2.73, 2.14, 0.732, 0.592, 2.1256
6. Which could be the remainder when a whole number is divided by 14? 6, 16, 28, 114, 196

Part 2 Practice Problems: ***More challenging problems that you must show all of your work on in order to earn full credit.* (1 point per problem)**

1. A suit normally sells for $148, but is on sale for 30% off. What is the cost of the suit?
2. A taxi service charges $5.50 for the first 1/5th of a mile, $1.50 for each additional 1/5th of a mile, and 20 cents per minute of waiting time. Joan took a cab from her place to a flower shop 8 miles away, where she bought a bouquet, then another 3.6 miles to her mother’s place. The driver had to wait 9 minutes while she bought the bouquet. What was her taxi cab fare?
3. The ratio of adults to children at the school swim party is 3 to 7. What percent of those at the swim party are children?
4. In degrees Fahrenheit, the temperature in Homer, Alaska was -18° at 12:00 PM. By 12:00 AM, the temperature had dropped 10°. What was the temperature at 12:00 AM?
5. Evaluate the expression (x – 2y)2 where x = 3 and y = 2
6. A rock group with 5 musicians gets 25% of the gross sales of their new album, but they have to give their agent 15% of their share. If the album grosses $20,000,000, what is each band member’s share?
7. Julia earned $5.20 per hour for 3 ½ hours and Suki earned $4.80 per hour for 5 ¼ hours. Who earned more money and how much more?
8. Richard sells cell phones. He is paid a commission of 10% for every phone he sells. The phones cost $140 each. How many phones must Richard sell in order to be paid $840?
9. If a = 3 and b = -2, what is the value of a2 + 3ab – b2 ?
10. 34 is what percent of 80?
11. What is the least common multiple of 5, 8, and 12?
12. Daniel’s Department Store reduced the price of a $30 shirt by 20%, but later raises it again by 20% of the sale price. What is the final price of the shirt?
13. How many 3-inch segments can a 4.5-yard line be divided into?
14. Dave can deliver four newspapers every minute. At this rate, how many newspapers can he deliver in two hours?
15. A man decided to buy new furniture from Futuristic Furniture for $2600. Futuristic Furniture gave the man two choices: pay the entire amount in one payment, or pay $1000 as a down payment and $120 per month for two full years in the financial plan. If the man chooses the financial plan, how much more would he pay?
16. Charles A. Lindbergh’s airplane *Spirit of St. Louis* was 27 feet, 8 inches long, with a 46-foot wingspan. If you are making a 1/15 scale model of this airplane, what should be the length of the model’s wingspan, in feet?
17. Samantha had 3 more cookies than Arthur. Then Arthur gave her 4 of his cookies. Now how many more cookies does Samantha have than Arthur?
18. What is the value of |9 – x| if x=11?
19. Teams in the Junior Division of the youth basketball league are made up of thirteen-year-olds and fourteen-year-olds only. On each of the 3 Junior Division teams there are 4 thirteen-year-olds and 5 fourteen-year-olds. What is the total number of players on all 3 Junior Division basketball teams combined?
20. Pinecki normally rides her bicycle to school at an average rate of 12 miles per hour. She leaves home at 8:00 am and arrives at school at 8:15 am. Today she left home at 8:00 am and after riding 5 minutes at her normal average rate, she had a flat tire. She spent 5 minutes repairing the tire. At what average rate, in miles per hour, must Pinecki ride the remainder of the distance so that she arrives at school at 8:15 am?
21. Nathan is looking at a scaled map of the campus. Each ¼ inch on the map represents 25 feet. On the scaled map, the distance from the newspaper stand to the campus mailbox is 3 ¾ inches. How far is it, in feet, from the newspaper stand to the campus mailbox?
22. Les made a long distance call from a pay phone. The charge was 60 cents for the first 3 minutes and 15 cents for each additional minute. If he spent a total of $3.00 on the phone call, what was the maximum number of minutes his call could have lasted?