Palm Harbor University's

19th Annual Mighty Mu

6th Grade Individual

The abbreviation NOTA means "None Of The Above" answers are correct. These first few questions are easy, but the questions will grow more challenging as the test progresses! Good luck and have fun!

1. Solve the following expression, rounded to the nearest whole number.
$$67.5 - 81/9 \times (0.76 + 2.24)$$

   A) 40 B) 41 C) 65 D) 64 E) NOTA

2. What is 239860 divided by 358?

   A) 671 B) 668 C) 669 D) 675 E) NOTA

3. It's Aditi's 17th birthday today. She wants to buy a cake with enough slices to feed the 22 other students, 1 teacher, and herself in her favorite math class. She needs to buy enough candles to match the age she is turning. 2 candles cost \$1.50 and a cake with 12 slices is sold for \$14.99. For each additional 3 slices of cake, the cost of the cake increases by \$3. Each person in Aditi's class, including herself and her teacher, gets 1 slice of cake, and no person can go without cake. What is the minimum amount of money, in dollars, Aditi spends on her single birthday cake and 17 candles?

   A) \$28.49 B) \$27.74 C) \$52.49 D) \$39.74 E) NOTA

4. What is 300% of 60% of 24% of $\frac{5}{24}$?

   A) 1/180 B) 1/100 C) 1/360 D) 9/100 E) NOTA

5. Which of the following values for y, if any, makes the below equation true?
$$y - y + 2.47y + 5.53y - 144/4 - 3 = -13 \times 3 + 2^3 y$$

   A) y =2.01 B) y =3/4 C) y =22.4
   D) y =all real numbers E)NOTA

6. It takes Kyle 1.5 minutes to solve 4 math problems, and Malery 5 minutes to solve 12 math problems. Assuming both Kyle and Malery solve math problems at constant rates, who solves the most math problems in 45 minutes? How many more math problems does the faster person solve than the slower person?

   A) Kyle solves 30 more problems than Malery.
   B) Kyle solves 12 more problems than Malery.
   C) Malery solves 16 more problems than Kyle.
   D) Malery solves 9 more problems than Kyle.
   E) NOTA

7. Ethan ordered a large pizza to share with the 3 people at his party. When the delivery guy arrived, Ethan noticed the delivery guy had eaten 1/12 of the pizza in the car. Luckily, Ethan has exceptional pizza-cutting skills and can cut the remaining pizza into equal slices. What size slices of the remaining pizza will each person get if everyone at the party, including Ethan, shares the remaining pizza equally?

   A) 11/24 B) 11/36 C) 11/48 D) 12/48 E) NOTA

8. Burt is trying to write an equation to model how fast his bees fly. He found that they fly at a constant rate all the time. Below are times and distances that Burt recorded by observing his bees on a daily basis. Note: 1 yard=3 feet

Distance (d)	Time (t)
36 feet	8 seconds
9 yards	6 seconds
9 feet	2 seconds

   Based on Burt's recorded data, which equation below accurately models how fast Burt's bees fly, in feet per second?

   A) $d = \frac{9}{2}t$ B) $d = \frac{27}{2}t$ C) $d = \frac{2}{9}t$ D) $d = \frac{2}{27}t$ E) NOTA

9. Two machines are built at Palm Harbor University to process numbers. Machine A takes two numbers and outputs their greatest common factor. Machine B takes two numbers and outputs their least common multiple. Pepe uses Machine A to process 35 and 21 and gets a number X. Then he uses Machine A again to process 91 and 78 and gets a number Y. Finally, he takes X and Y and puts them into Machine B. What is his final output?

   A) 7 B) 91 C) 49 D) 21 E) NOTA

10. Aliens in a UFO observe a rectangular strip of land with length $\frac{2}{3}$ mile and area $2\frac{1}{2}$ square miles. How wide is this rectangular strip of land, in miles?

   A) $3\frac{3}{4}$ B) $1\frac{2}{3}$ C) $\frac{4}{15}$ D) $1\frac{1}{4}$ E) NOTA

11. Chloe maps her neighborhood on a coordinate plane, with her home on the origin and each unit representing one mile. She maps her friend Daria's house at (0,7) and a park at (15, 0). Finally, she maps her school at (15, -5). Every morning, Chloe starts at her house, drives to Daria's house, returns home, drives to the park, and then stops at school. If Chloe's car has a gas mileage of 17 miles per gallon, how many gallons does she use in a single morning?

    A) 17 B) 34 C) 51 D) 2 E) NOTA

12. It's election year in Mathlandia, and the final two candidates are Matt Amatics and Polly Gon. The ratio of male voters for Polly to male voters for Matt is 1:2. The ratio of female voters for Matt to female voters for Polly is 1:3. If Polly received 500 male votes and Matt received 300 female votes, who won the presidency, and by how much?

    A) Matt won the presidency by 100 votes.
    B) Matt won the presidency by 850 votes.
    C) Polly won the presidency by 100 votes.
    D) Polly won the presidency by 850 votes.
    E) NOTA

13. Solve $(987/0.6 + 2.4)/(5 \times 0.04)$

    A) 329 B) 1645 C) 8225 D) 8237 E) NOTA

14. Anacletus buys an empty cardboard cube with side lengths of 6 inches. He places a solid stone cube with side lengths of 3 inches inside the cardboard cube. He closes the cardboard box. What is the volume of the air inside the cardboard box in cubic feet?

    A) 189 B) $15\frac{3}{4}$ C) 216 D) $\frac{7}{64}$ E) NOTA

15. The distance from the center of the Earth to sea level is approximately 4000 miles. Mrs. Dang runs at a constant speed of 8 miles per hour over all terrains, including water and land. About how long, in hours, will it take Mrs. Dang to run once around the Earth along the equator? Use $\pi = 3.14$. Assume that she runs is a straight line at sea level and her elevation does not vary.

    A) 8000 hours B) 4000 hours C) 500 hours
    D) 1000 hours E) NOTA

16. A city planner wants to build a park to liven up the downtown area. He plots a small section of the city on a coordinate plane. Main Street runs north-south through a school at (1, 2). Central Avenue runs east-west through the town hall at (5, 10). Brad Boulevard runs through the school and the town hall. If the city planner wants to create the park in the space between the three streets, what will the area of the park be?

    A) 32 square units B) 12 square units C) $12+4\sqrt{3}$ square units
    D) 16 square units E) NOTA

17. Haru and Makoto are swimmers competing against each other. Haru can swim 500 meters in four minutes. Makoto can swim 800 meters in 8 minutes. They both compete against each other in a 1000 meter race, but Haru gives Makoto a one minute head start. Who finishes first, and by how much do they win?

    A) Haru wins by 1 minute. B) Makoto wins by 1 minute.
    C) Haru wins by 2 minutes. D) Makoto wins by 2 minutes.
    E) NOTA

18. Phillip has a car with a 30-gallon gas tank. The tank is completely empty when he goes to the El Cheapo gas station. Phillip fills the tank until it is completely full. In total, he paid $120.30 for the gas. How much is a gallon of gas at El Cheapo when Phillip fills his tank?

    A) $3.61 B) $4.01 C) $3.05 D) $4.43 E) NOTA

19. Dorothy has a box of shoes that she need to wrap with gift paper. Dorothy uses 264 square inches gift paper to completely cover the shoe box, leaving no holes and no overlapping gift paper. The shoe box has a length of 11 inches and a height of 4 inches. How wide is the shoe box, in feet?

    A) $\frac{1}{2}$ foot B) $\frac{1}{8}$ foot C) $\frac{3}{8}$ foot D) $\frac{1}{4}$ foot E) NOTA

20. Yasmine buys 24 containers of yogurt, each containing 4.5 fluid ounces of yogurt. If one cup is equivalent to 8 fluid ounces of yogurt, how many $\frac{3}{4}$ cup servings of yogurt did Yasmine buy?

    A) 11 B) 18 C) 32 D) 13.5 E) NOTA

21. Which of the following values for Y, if any, makes the inequality below true?

$$3Y < (7.1 + 3.4) \times 8$$

    A) $Y = 84$ B) $Y = 28$ C) $Y = 26$ D) $Y = 30$ E) NOTA

22. Sally took a sample of six seashells by the seashore. Sally found the average diameter of the seashells in her sample was 16 millimeters. 5 seashells and their diameters are recorded below. What is the exact diameter of the 6th seashell, in millimeters?

Seashell	Diameter (millimeters)
1	17
2	16
3	12
4	20
5	18
6	?

A) 11 B) 15 C) 21 D) 13 E) NOTA

23. Frank is a fancy famer and likes to use a special pattern to determine how many plants to grow in each row in the field. Frank uses a formula which tells him to grow 4 plants in the row #1, 7 plants in the row #2, 10 plants in the row #3, 13 plants in the row #4, and so on. This same pattern continues for the rest of the rows on Frank's farm. Which of the following equations, if any, correctly relate the row number (r) and number of plants grown (p)?

A) $p=2r+3$ B) $p=4r-1$ C) $p=r+3$ D) $p=3r+1$ E) NOTA

24. Jin recently bought VIP concert tickets for both himself and his six other best friends. One standard ticket costs $137, and one VIP ticket is the price of one standard ticket plus 40% of one standard ticket. What is the difference between buying VIP tickets for everyone (including himself) and buying standard tickets for everyone instead?

A) $575.40 B) $383.60 C) $328.80 D) $493.20 E) NOTA

25. Sophia has 26 days until her exams and she wants to prepare by studying some subjects for a specific amount of time each day. For math, she wants to study at least one hour to two hours each day. For history, she wants to study between 30 to 45 minutes each day. For science, she wants to study between 45 minutes to an hour each day. What is the difference between the most amount of hours and the least amount of hours Sophia can study divided by the days left until she has her exams?

A) 90 min B) 60 min C) 45 min D) 120 min E) NOTA

26. In a baking class, Joshua is teaching his seventeen students how to bake cupcakes. When mixed with the other ingredients in the recipe, 4 cups of flour makes the cupcake mixture weigh 3.5 lbs. Joshua's cooking assistant Vernon wants to alter the recipe to bake even more cupcakes for more people. If Vernon uses 17 cups of flour, how many lbs. would his cupcake mix weigh?

A) $16\frac{1}{2}$ lbs. B) $59\frac{1}{8}$ lbs. C) 17 lbs. D) $14\frac{7}{8}$ lbs. E) NOTA

27. Cube A weighs exactly 16 lbs. Cube B is going to be a replica of Cube A, except its sides will be three times as long as the sides of Cube A. What will be the weight of Cube B?

A) 48 lbs B) 1728 lbs C) 432 lbs D) 144 lbs E) NOTA

28. Simplify the expression

$$5 + 12^2 - 18 \times 26 - 34 \times 13 + 42 \times 9 + 64 \times 14 - 2017.$$

A) -1623 B) -1827 C) -1347 D) -1586 E) NOTA

29. Given a = 7, b = 8, c = 3, d=9, e = 4, & f = 5 find the value of the following expression to the nearest integer:

$$\frac{a \times (b \times c + d \times e) - b \times c}{d \times e \times f}$$

A) 2 B) 6 C) 9 D) 10 E) NOTA

30. Given the following set of integers:

P={10, 13, 16, 28, 54, 12, 15, 17, 13, 10, 56, 32, 108, 112, 37, 85, 2017}

Calculate the expression below with respect to the given set of integers.

$$\text{median} \times \text{LV} + \text{mean} \times \text{range} - \text{sum} \times \text{LV}^2 - \text{HV} \times \text{median}$$

(where LV = lowest value in P, HV = highest value in P)

A) 8611 B) -8611 C) 2437 D) -2437 E) NOTA