NOTE: "e. None of these answers" is a choice for all questions, in case the answer is not given or there is a problem with the question.

1. A jar contains 60 marbles, 8 of which are blue. The probability of picking a red or blue marble is $^{1}/_{3}$. How many red marbles are in the jar?

a. 8 b. 12 c. 15 d. 20

2. The average life span is 72 years; the average lifetime food consumption is 40 tons. Since Karthik only ever eats 4-ounce cans of Spam, how many cans will he eat in a lifetime?

A 320,000 b. 2,304,000 c. 640,000 d. 11,520,000

3. If x – 4 is 2 greater than y, then x + 5 is how much greater than y?

a. 5 b. 9 c. 11 d. 14

4. Simplify: $\dfrac{\frac{3}{8}-\frac{2}{3}}{\frac{3}{4}+\frac{1}{3}}$

a. $^{4}/_{3}$ b. $^{7}/_{13}$ c. $^{-7}/_{26}$ d. $^{-25}/_{26}$

5. Let a☺b = a^2 + b + 33. Find 6☺4 and convert to base 2.

a. 1010101 b. 1001011 c. 1001001 d. 1101001

6. The sum of three consecutive odd integers is 15. Find the sum of the multiplicative inverses of these same integers.

a. $^{12}/_{105}$ b. $^{71}/_{105}$ c. $^{-15}/_{105}$ d. $^{43}/_{105}$

7. Mrs. Clopton has about 320 ideas a day, but at least 75% of those get interrupted. Of the interrupted ideas, only 1/3 return later. How many ideas does Mrs. Clopton lose every day?

a. 160 b. 240 c. 80 d. 120

8. Daniel is always late. When we go to Randolph the bus leaves at 5:45 AM. If it takes this student 35 minutes to eat and dress and 22 minutes to drive to school, what is the latest time Daniel should wake to get to the bus 5 minutes before it leaves?

a. 4:48 am b. 4:43 am c. 4:46 am d. 4:42 am

9. Find the measure of an exterior angle formed by the extension of one edge and a side of a regular icosagon.

a. 162° b. 20° c. 18° d. 158°

10. Solve for n: $10^n = 10^{-5} \times \sqrt{\frac{10^{73}}{0.001}}$

a. 30 b. 33 c. 36 d. 39

11. Amy raises mutated unicorns. Seventeen of her unicorns have gold eyes, 19 have blue fur, and 14 have rainbow wings. Of the gold-eyed unicorns, nine have blue fur and eleven have rainbow wings. Six unicorns have blue fur and rainbow wings, but not gold eyes. If Amy has 28 unicorns, how many of them have all three traits?

a. 3 b. 4 c. 5 d. 6

12. Find the number of distinct arrangements in $\frac{BUCCANEER}{JAGUAR}$.

a. 252 b. 504 c. 441 d. 525

13. While traveling to Mobile for State MathCounts, the team was able to go 70 mph for 3 hours, but, due to construction, could only go 40 mph for 1.5 hours. What was their average speed?

a. 48 mph b. 50 mph c. 55 mph d. 60 mph

14. Mariam can bake 10 special pi pies in 30 minutes. Nora can bake 25 special pi pies in 80 minutes. Jessica can bake 15 special pi pies in 90 minutes. How many special pi pies can all three girls cook in 32 minutes?

a. 26 b. 39 c. 22 d. 34

15. Twice the sum of three times a number and 60 is 155 greater than the opposite of the number. What is the number?

a. 5 b. 6 c. -5 d. -6

16. $1234_5 \times 67_8 = \_\_\_\__9$

a. 16875 b. 17765 c. 15565 d. 18865

17. At the Hoover High tournament, the bag of Kisses contained milk chocolate, white chocolate, and caramel kisses in the ratio of 21:10:11 respectively. If there are 126 kisses in the bag, what is the probability that Varsha picks a caramel then a milk chocolate kiss?

a. $^{11}/_{125}$ b. $^{33}/_{250}$ c. $^{5}/_{42}$ d. $^{16}/_{21}$

18. Circle A is centered at (2,5) while Circle B is centered at (8,2). What is the slope of the line that joins A and B?

a. $^{1}/_{2}$ b. $^{-1}/_{2}$ c. 2 D -2

19. What is the probability of randomly picking one word out of this sentence so that the chosen word has one syllable?

a. $^{5}/_{7}$ b. $^{13}/_{21}$ c. $^{7}/_{16}$ d. $^{3}/_{7}$

20. A right triangle with area 72 square units has a hypotenuse of $12\sqrt{2}$ units. What is the sum of the lengths of its legs?

a. 18 units b. 20 units c. 24 units d. 26 units

21. Find the sum of the solutions, given m = 12, n = 9 and z = 5:

$$\frac{(m+n)^2 \pm (m-n)^2}{n+2m-z}$$

a. $^{882}/_{21}$ b. $^{441}/_{14}$ c. $^{63}/_{2}$ d. $^{881}/_{14}$

22. If set A contains the first seven perfect squares, set B contains the first 10 positive multiples of 3, and set C contains the factors of 36, find the sum of the elements in (A∩B) U (C∩B).

a. 39 b. 36 c. 33 d. 30

23. Find the slope of a line perpendicular to the line 3y – 4x = 6.

a. $^{3}/_{4}$ b. $^{4}/_{3}$ c. $^{-3}/_{4}$ d. $^{-4}/_{3}$

24. If the numerator and denominator of a fraction are both decreased by 1, the fraction equals $^{2}/_{3}$. If the numerator and denominator of the same fraction are both increased by 1, the fraction equals ¾. What is the original fraction?

a. $^{2}/_{5}$ b. $^{4}/_{13}$ c. $^{3}/_{4}$ d. $^{4}/_{5}$

25. A circle has a circumference of 27π. What is the square of half the radius of the circle?

a. 45.5625 b. 182.25 c. 162.5625 d. 364.5

TIE-BREAKERS. Answer on the back of your scantron sheet.

1. A rectangle with integral side lengths has a diagonal of $5\sqrt{13}$. If its perimeter is 50 m, what is its area?

2. Find the sum of all three-digit numbers that can be formed using 3, 4 and 5 only once in each number.

3. $2012_3 + 2012_6 =$ _____$_9$