MATHUS मेथस ACADEMY
BRING THE BEST OUT OF CHILDREN

Grade 6 **MathGenius National Contest March 2017** **Critical Thinking Math**

1. If $3^7 \times 3^{11} = 3^n$, what is the value of *n*?

A. 77
B. 18
C. 4
D. 3^{77}
E. 3^{15}

2. What is the value of $\frac{1+3+5\ldots+79}{2+4+6+\cdots+80}$?

A. $\frac{79}{80}$
B. $\frac{39}{40}$
C. $\frac{40}{41}$
D. $\frac{79x80}{80x81}$
E. $\frac{2}{10}$

3. 20% of 5% equals ___ of 50%?

A. 20
B. 2
C. $\frac{2}{10}$
D. $\frac{2}{100}$
E. $\frac{2}{1000}$

4. Jennifer rode her bike from her home to school at 15 miles per hour. During return, she rode back from school to home at 10 miles per hour. What is Jennifer's average speed, in miles per hour?

A. 12.5
B. 12
C. 13
D. 25
E. 30

5. How many integers exist whose squares are between 0 through 200?

A. 10
B. 14
C. 15
D. 16
E. 29

6. Which of the following is the closest to $\sqrt[3]{0.512}$?

A. $\frac{1}{2}$
B. $\frac{1}{4}$
C. $\frac{1}{8}$
D. 1
E. 1.6

7. If you roll a pair of dice, what is the probability that the sum is greater than or equal to 10?

A. $\frac{1}{3}$

B. $\frac{1}{4}$

C. $\frac{1}{6}$

D. $\frac{1}{8}$

E. $\frac{1}{10}$

8. If x * y is defined as $x^2 - xy$, what is the value of 4 * (5 * 6)?

A. 36
B. 120
C. -4
D. -8
E. 40

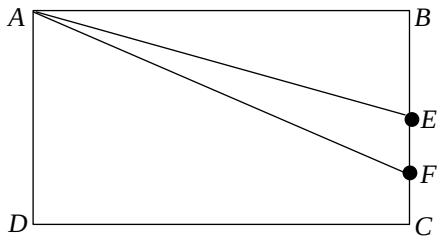
9. The measures of the angles in a triangle are x, y, and z. If the average of y and z equals x, and y = 5z, what is the average of x and y?

A. 80
B. 75
C. 60
D. 40
E. 100

10. Jessica has 84 pink beads and 105 purple beads. She wants to put them in decorative boxes. She wants equal number of beads in each box and only one color in each box. What is the minimum number of boxes she would need?

A. 7
B. 8
C. 9
D. 12
E. 20

11. In the below rectangle, *E* is the mid-point of *BC* and *F* is the mid-point of *CE*. What is the ratio of the area of ΔAEF to the area of the rectangle *ABCD*?



A. 1:16
B. 1:12
C. 2:15
D. 1:8
E. 1:4

12. The quotient of two consecutive whole numbers is $1.\overline{1}$. What is their sum?

A. 21
B. 19
C. 17
D. 23
E. 101

13. A circle is marked with nine points on its circumference. How many different triangles can be formed using any three points on the circumference of the circle?

A. 27
B. 72
C. 84
D. 252
E. 504

14. What is the largest odd natural number that is a factor of 8!?

A. 7
B. 35
C. 105
D. 315
E. 525

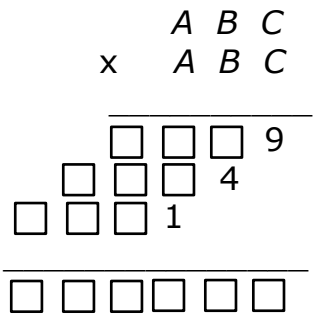
15. Ursula's tub has two faucets. When only faucet A is turned on, the tub fills in 1 hr. When only faucet B is turned on, the tub fills in 2 hrs. If both the faucets are turned on, how long will it take to fill the tub?

A. 40 minutes
B. 30 minutes
C. 45 minutes
D. 1.5 hrs
E. 3 hrs

16. Locker numbers at Riverview Middle School start with 1. If the digit 3 is used exactly 137 times, what is the number on the last locker?

A. 337
B. 341
C. 352
D. 360
E. 361

17. In the below multiplication, each of the alphabets represent a unique, non-zero digit. Each blank square also represents a digit. What is the value of $A+B+C$?



A. 18
B. 16
C. 14
D. 9
E. 6

18. A rectangle has area of 18 square units. Its diagonal length is $3\sqrt{5}$. What is its perimeter?

A. 45
B. 12
C. 36
D. 90
E. 18

19. In how many ways can 6 boys stand in a straight line, if two boys always want to stand next to each other?

A. 120
B. 240
C. 360
D. 480
E. 720

20. What is the smallest whole number exponent of 18 that is divisible by 12^{90}?

A. 18^{45}
B. 18^{60}
C. 18^{90}
D. 18^{120}
E. 18^{180}

For any questions, please reach us at support@mathusacademy.com or 2098-MATHUS (209.862.8487)