MathMatters Contest
Beehive Science and Technology Academy

6th Grade
SAMPLE TEST BOOKLET

Instructions:

1) Do not open this test booklet until instructed to do so.
2) You will have 40 minutes to answer 30 questions. Each question is multiple choice with answer selections of A, B, C and D.
3) All answers must be marked by filling in the circles on the **answer sheet**. Be sure to fill in each circle completely. **No answers written in the test booklet will be counted.**
4) Each problem is worth 1 point, except for the last 5, which are 2 points each. Unanswered questions get no credit. There is no penalty for wrong answers. Don't spend too much time on any question.
5) Remember that this is a competition, not a test. There is no failing or passing score. Just fo your best.
6) Use the provided space below each question for your calculations. You may use any space in the exam booklet as scratch paper. You may take this exam booklet with you after the test.
7) Calculators are **not** allowed.

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1) $23 \times 24 = 23 \times 23 + \underline{\ ?\ }$

   A) 23   B) 24   C) 25   D) 47

2) Aya walked by 19 doors, knocking on every second door. Cayo walked by the same 19 doors, knocking on every third door. If they started from the same spot, they knocked on __?__ of the same doors.

   A) 1   B) 3   C) 4   D) 5

3) $23 \times 100 + 4 \times 10 + 5 \times 1 = 345 + \underline{\ ?\ }$

   A) 2   B) 20   C) 200   D) 2000

4) If the average measure of the least and greatest angles of a triangle is 80°, the measure of the third angle must be

   A) 10°   B) 20°   C) 100°   D) 140°

5) How many of the 10 smallest positive integers are the sum of two different positive integers?

   A) 5   B) 8   C) 9   D) 10

6) What is the greatest possible value of the greatest of 3 unequal positive integers whose sum is 39?

   A) 36   B) 35   C) 15   D) 13

7) If the number that is one less than a positive prime number is also prime, the product of these two primes must be

A) 2   B) 3   C) 5   D) 6

8) How many common multiples of 12 and 18 are less than 12×18?

A) 5   B) 4   C) 3   D) 2

9) Together, Ed and Joe can milk 5 times as many cows in a day as Ed can milk by himself in a day. If Joe can milk 48 cows by himself in a day, how many cows can Ed milk by himself in 7 days?

A) 63   B) 70   C) 84   D) 96

10) If a square's perimeter is 45 cm more than its side-length, its area is

A) 135 cm^2 B) 165 cm^2 C) 180 cm^2 D) 225 cm^2

11) Eve ran half the total length of Trail 1 before turning onto Trail 2 and running half as far as she'd run on Trail 1. If Eve ran a total of 3 km, how long is Trail 1?

A) 6 km   B) 5 km   C) 4 km   D) 3 km

12) The number that is four hundredths less than four tenths is

A) 0.36   B) 0.44   C) 0.54   D) 0.96

13) I reversed the order of the 4 different digits of a positive 4-digit integer and added this new integer to the original integer. What is the greatest possible sum of the two integers?

     A) 18 447   B) 18 537   C) 18 547   D) 19 998

14) The number that is 40% less than 400 is 20% more than

     A) 160   B) 200   C) 240   D) 320

15) An isosceles triangle with integer side-lengths has perimeter 2^{10} cm. The greatest possible length of a side is

     A) 510 cm   B) 511 cm   C) 512 cm   D) 1022 cm

16) Fern traveled 3^5 times as many km last year as Holly did. Ivy traveled 3^5 more km last year than Fern did. If Holly traveled 3^5 km last year, how many km did Ivy travel last year?

     A) 3^{15} B) $3^5 + 6^5$ C) $3^{10} + 3^5$ D) $3^{10} + 3^{10}$

17) In a set of 15 tiles, each tile is numbered with a different integer from 1 to 15. I have 3 such sets of tiles. If I pick 25 tiles from these 3 sets, what is the least number of those I pick that <u>must</u> be odd-numbered?

     A) 1   B) 2   C) 3   D) 4

18) How many factors of $1 \times 4 \times 9 \times 16$ are perfect squares?

     A) 8   B) 7   C) 5   D) 4

19) I planted an oak tree between every 2 adjacent ash trees in a row of 15 ash trees. Then I planted a maple tree between every 2 adjacent ash and oak trees. How many more maple trees than oak trees did I plant?

A) 1   B) 14   C) 15   D) 29

20) What is the ones digit of the sum of the 100 consecutive integers whose least integer is 2024?

A) 0   B) 2   C) 3   D) 5

21) Dividing 10^3 by a 3-digit integer leaves a remainder of <u>at most</u>

A) 1   B) 250   C) 499   D) 501

22) The math team has 81 members. If 3/4 of students in my grade comprise 2/3 of the math team, how many students are in my grade?

A) 27   B) 41   C) 54   D) 72

23) How many positive 3-digit integers whose digits are consecutive and ordered least to greatest, from left to right, are multiples of 4?

A) 3   B) 2   C) 1   D) 0

24) Forty percent of the 10 coins, a combination of nickels and dimes, that I put in my pocket fell out. The value of the remaining coins is 50% less than the total value of the coins I put in my pocket. How many total nickels **could** I have left in my pocket?

A) 1   B) 2   C) 3   D) 4

25) I divided 2024^{2024} by 2, then divided that quotient by 2, and so on, dividing quotients by 2 until I got an odd quotient. How many times did I divide by 2?

   A) 3×2024 B) 3^{2024} C) 1012×2024 D) 1012^{2024}

26) What is the average of 23 consecutive integers if the greatest of the 23 integers is 2023?

   A) 2001   B) 2011   C) 2012   D) 2013

27) The product $6 \times 6 \times 6$ has exactly __?__ different positive even factors.

   A) 4   B) 6   C) 8   D) 12

28) The total value of Cy's quarters is 5 times the total value of his dimes. If Cy has 36 coins all together, how many of them are dimes?

   A) 9   B) 12   C) 18   D) 24

29) If the total number of minutes I've played video games is the square of the number of months in 15 years, for how many total hours have I played video games?

   A) 180   B) 225   C) 324   D) 540

30) The number of 2-digit prime numbers less than 50 that can be written as the sum of two different prime numbers is

   A) 0   B) 4   C) 6   D) 8