Bergen County Academies Math Competition
Typical Questions

Fourth Grade

1. A problem author for a math competition wrote 44 problems so far, but he needs 50. How many more problems must he write?

2. Express $\frac{13}{4}$ in decimal form.

3. If a bicycle costs $35.55 and Tom has $29.55, how many more dollars does he have to save in order to buy the bike?

4. Calculate $1 + 2 \times 3$.

5. Calculate $\frac{1}{2} - \frac{1}{3}$ (give in fractional form).

6. What is the product of all the numbers on the buttons of a standard telephone?

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Fifth Grade

1. Evaluate $17 - 16 + 15 - 14 + \cdots + 3 - 2 + 1$.

2. The Academy Math Team wants to purchase some tee shirts. The first tee shirt costs $182, and every other shirt costs $2. If there are 90 people on the team, and the team equally distributes the cost amongst its members, how much does each member have to pay?

3. On a warm day, the temperature was $77\,°\text{F}$. The conversion between Centigrade and Fahrenheit is: $°\text{C} = \frac{5}{9} \times (°\text{F} - 32)$. What was the temperature in degrees Centigrade?

4. A painter mixes 4 gallons of white paint with 1 gallon of red paint to make 5 gallons of her signature pink paint. Each gallon of white paint costs $2 and each gallon of red paint costs $3. How much money does the painter need to make 400 gallons of pink paint?

5. What two-digit number evenly divides both 323 and 391?

6. Compute 1.55×21.4.

Sixth Grade

1. In the game of *Mafball*, points can only be scored in 3 points or 5 points. What is the largest unattainable score in *Mafball*?

2. Andy can paint a fence in 1 hour by himself, and Bobby can paint a fence in 2 hours by himself. How many minutes does it take Andy and Bobby to paint a fence together?

3. If A, B, C are three distinct points that do not all lie on one line, how many parallelograms can be formed using A, B, C, and a fourth point?

4. A fruit company orders 4800 pounds of oranges at $1.80 per pound. The shipping cost is $3000. Suppose 10% of the oranges are spoiled during the shipping and the remaining oranges are all sold. What should the selling price per pound be, given that the fruit company wants to make a net 8% profit?

5. Let $\lfloor x \rfloor$ denote the greatest whole number less than or equal to x. For example, $\lfloor 4.6 \rfloor = 4$, $\lfloor \frac{16}{7} \rfloor = 2$, and $\lfloor 5 \rfloor = 5$. Calculate $\lfloor \frac{1}{3} \rfloor + \lfloor \frac{2}{3} \rfloor + \lfloor \frac{3}{3} \rfloor + \cdots + \lfloor \frac{97}{3} \rfloor + \lfloor \frac{98}{3} \rfloor + \lfloor \frac{99}{3} \rfloor$.

6. Compute $664.02 \div 9.3$.

Seventh Grade

1. A *palindrome* is a number such that it is read the same regardless of whether the digits are read forwards or backwards. For example, 141, 7007, and 8888 are *palindromes*, whereas 345 and 5959 are not. How many even four-digit numbers are *palindromes*?

2. Philip has 3 triangles and 6 pentagons. Let S be the total number of sides of the shapes he has. Let N be the number of shapes he has. What is $S + N$?

3. Yao Ming is 7 feet 5 inches tall. A typical basketball hoop is 10 feet from the ground. How many inches must Yao jump to touch the hoop with his head?

4. In triangle ABC, $\overline{BC} = 4$ and $\overline{CA} = 6$. If the perimeter of the triangle is 4 times the length of side $\overline{BC}$, what is the length of $\overline{AB}$?

5. Find the height of a triangle with base 20 and area 60.

6. What is the area of a square in square feet, if each of its diagonals is 4 feet long?

1. How many of the following are always true:
   I: the square of an integer is a whole number
   II: if $a \neq b$ and $b \neq c$, then $a \neq c$
   III: every integer has a rational inverse in multiplication
   IV: the square root of a positive integer is real

2. A number is *strictly decreasing* if each digit is strictly less than the digit to its left. For example, 543, 531, and 962 are *strictly decreasing*, whereas 562, 537, and 322 are not. How many integers between 100 and 600 are *strictly decreasing*?

3. What is the units digit of $13^{17} + 17^{13}$?

4. There are ten lottery tickets in a hat, and four of them are winning tickets. First, Joe reaches in and takes a ticket. Then, Kim reaches in and takes a ticket from the remaining nine. What is the probability that Kim takes a winning ticket?

5. A *silly* number *ababab* is formed by repeating a two-digit number *ab* exactly three times. For example, 252525 is a *silly* number. What is the greatest common factor of all *silly* numbers?

6. A number p yields a remainder of 3 when divided by 5, a remainder of 5 when divided by 7, and a remainder of 11 when divided by 13. If p is less than 1000, what is the maximum value of p?