

Washington State Math Championship – 2009
Potpourri Grade – 5th Grade

WASHINGTON STATE
MATH CHAMPIONSHIP



BLAINE SCHOOL DISTRICT

ConocoPhillips
Ferndale Refinery

1. While reading the book “Why Math Competitions Rock”, Sue decided to turn to a random part of her book and multiply the two page numbers that were showing. If she found the product of the page numbers was 7832, what were the two page numbers?
2. What is the next number in the following sequence?
3, 4, 8, 17, 33, 58, ____
3. Mr. Smith has three children, Moe, Joe, and Poe. Mr. Smith tells you that the product of his children’s ages is 36, that Moe and Joe are twins, and that Poe, the oldest child, is at least two years older than his brothers. If all of the children’s ages are single digits, what is Poe’s age?
4. What is the smallest positive integer that is divisible by each of the numbers one through seven?
5. Craig is able to collect 20 pinecones in an hour, while his friend Aaron is able to collect 40 pinecones in an hour. If they were to work together, how long, in minutes, would it take them to collect 195 pinecones?
6. Express the repeating decimal $0.\overline{315}$ as a reduced fraction.
7. After paying for a cup of coffee during his lunch break, Pinocchio received \$0.92 in change. When he got back to work, he told his friend that he had received eight coins in change. How many pennies did he receive?
8. What is the greatest common divisor of $2^5 \times 3^2 \times 5^4$ and $2^4 \times 3^7 \times 5^3$?
9. Suppose that each of letters M, A, T, H, and S represents a different digit (0 through 9). If S times the four-digit number MATH is equal to the four-digit number SMTM, what is the sum $M + A + T + H + S$?
10. What percentage of the squares of the one and two-digit positive integers have 1 as their units digit? **Express your answer to the nearest whole number percent.**

Washington State Math Championship – 2009
Potpourri Grade – 6th Grade

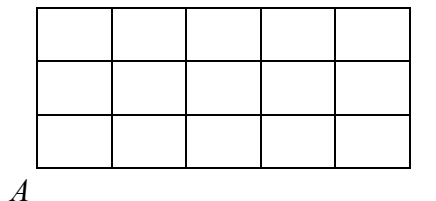


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7. What percentage of the squares of the one and two-digit positive integers have 1 as their units digit? **Express your answer to the nearest whole number percent.**
8. How many three-digit numbers are divisible by each of the first three prime numbers?
9. Suppose you have four rowers out at rowing practice who can each row across a lake at a different pace: the first rower can cross the lake in 20 minutes, the second in 15 minutes, the third in 10 minutes, and the fourth in 5 minutes. A boat will carry at most two rowers across at a time, but only one can row. Also, the slower rower must be the one rowing so that he/she can get more practice. What is the minimum amount of time, in minutes, that all four rowers can cross the lake?
10. Two positive prime numbers are said to be *twin primes* if they differ by 2. Define a *twin sum* to be the sum of two twin primes. What is the fifth smallest twin sum?

Washington State Math Championship – 2009
Potpourri Grade – 7th Grade



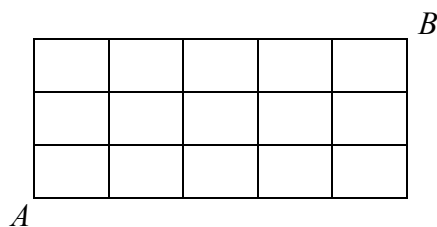
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7. Two positive prime numbers are said to be *twin primes* if they differ by 2. Define a *twin sum* to be the sum of two twin primes. What is the fifth smallest twin sum?
8. Express the binary number 11111011001_2 as a base ten number.
9. What is the greatest number of consecutive times that the product of the first 100 positive integers can be divided by 3 *without* leaving a remainder?
10. In the diagram below, if you are only allowed to travel up and to the right, how many different paths could you walk along the grid from point A to point B?



Washington State Math Championship – 2009
Potpourri Grade – 8th Grade



1. What percentage of the squares of the one and two-digit positive integers have 1 as their units digit? **Express your answer to the nearest whole number percent.**
2. How many three-digit numbers are divisible by each of the first three prime numbers?
3. Suppose you have four rowers out at rowing practice who can each row across a lake at a different pace: the first rower can cross the lake in 20 minutes, the second in 15 minutes, the third in 10 minutes, and the fourth in 5 minutes. A boat will carry at most two rowers across at a time, but only one can row. Also, the slower rower must be the one rowing so that he/she can get more practice. What is the minimum amount of time, in minutes, that all four rowers can cross the lake?
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7. In the diagram below, if you are only allowed to travel up and to the right, how many different paths could you walk along the grid from point *A* to point *B*?



8. When $(x + y)^6$ is expanded and simplified, what is the sum of the coefficients?
9. In class, you are playing a game where the students all stand in a circle, and the teacher walks around and taps every other person who is standing. Once you are tapped, you must sit down, and the last person who is standing is considered the winner. Suppose that there are 40 students (including yourself) in your class. If we consider the order in which you are tapped the first time to be your position in the circle (i.e., the fourth person tapped is in position four), in which position should you stand in order to win?
10. Compute and simplify the following infinite sum: $1 + 1/2 + 1/4 + 1/8 + 1/16 + \dots$