Washington State Math Championship – 2009
Individual – 5th and 6th Grade

The first ten problems are multiple choice and will count toward your team score.
Answer by CIRCLING the appropriate letter on the on the answer sheet.

1. In the product $1\times2\times3\times4\times5$, which number should be increased by one in order to maximize the resulting product?
    a. 1   b. 2   c. 3   d. 4   e. 5

2. A triangle with sides of length three, ten, and eleven is similar to a triangle whose sides are of length twenty-two, six, and x. What is x?
    a. 3   b. 6   c. 20   d. 30   e. 36

3. Which one of the following numbers is equivalent to a non-repeating decimal?
    a. 4/7   b. 9.502   c. $\sqrt{3}$ d. 10   e. $20.\overline{09}$

4. What is the ones digit of the product of the first twenty prime numbers?
    a. 0   b. 1   c. 3   d. 5   e. 7

5. Which of the following is the best estimate for the average height of a sixth grader?
    a. 1.5 meters   b. 82.5 centimeters   c. 25 inches   d. 9500 millimeters   e. 0.01 miles

6. Which of the following equations describes a line that passes through the points with coordinates (4, 3) and (2, 5)?
    a. $y = -x$ b. $y = x$ c. $y = x + 2$ d. $y = -x + 2$ e. $y = -x + 7$

7. How many lines of symmetry does an equilateral triangle have?
    a. 0   b. 1   c. 2   d. 3   e. 6

8. If some (at least one, but not necessarily all) gobblers are munchers, all munchers are strangers, and some strangers are mathematicians, which of the following statements is necessarily true?
    a. All gobblers are strangers
    b. All munchers are gobblers
    c. Some gobblers are mathematicians
    d. Some strangers are gobblers
    e. None of the above

9. Which of the following sets of three measurements could *not* describe the three sides of a triangle?
    a. 8 inches, 2 inches, and 11 inches
    b. 9 centimeters, 13 centimeters, 10 centimeters
    c. 3 meters, 3 meters, and 3 meters
    d. 10 feet, 1 foot, 10 feet
    e. 4 yards, 2 yards, and 3 yards

Washington State Math Championship – 2009
Individual – 5th and 6th Grade

WASHINGTON STATE
MATH CHAMPIONSHIP

$\sqrt{2009}$

BLAINE SCHOOL DISTRICT
ConocoPhillips
Ferndale Refinery

10. If a teacher were to raise the scores by one point on all 30 students' tests, which of the following would describe what would happen to the average score of the students' tests?
    a. The average would increase by 30
    b. The average would increase by 1/30
    c. The average would increase by 1
    d. The average would decrease
    e. The average would not change

11. What is the sum of the reciprocals of 2.5 and five-thirds? **Express your answer as a reduced fraction**.

12. What is the sum, as a decimal, of three hundred, seventeen hundredths, six tenths, four, and two thousandths?

13. Evaluate the following expression: $\dfrac{\sqrt{5^2-4^2}}{\sqrt{12^2+5^2}}$. **Express your answer as a reduced fraction.**

14. Susie has a collection of 500 stamps, 40 of which are her favorites. If she wants to pick out a stamp randomly from her collection to give to her best friend, what is the probability she will choose one of her favorite stamps to give to her best friend? **Express your answer as a reduced fraction.**

15. The average adult male is recommended to consume around 2000 calories per day. Suppose I wanted to consume only milk and cookies for an entire day, and that I will only consume each cookie with one-seventh of a glass of milk. If one glass of milk is 150 calories, and one cookie is 75 calories, what is the maximum number of cookies I could eat and still stay underneath the 2000 calorie recommendation?

16. When you got your math test back, you noticed that seven problems were marked wrong and that you received a 65%. If each problem was given equal weight, how many problems were on the test?

17. When walking across a golf course, a man carrying a bucket full of golf balls managed to run into quite a few obstacles. First, he lost a third of his golf balls when he tripped over a tee that someone left on the ground. Then, he lost a fourth of the remaining golf balls by stumbling in the sand pit. Finally, he lost a tenth of the balls he had left because an alligator attacked him. When he finally made it back to the clubhouse, he had 54 golf balls. How many golf balls did the man originally have?

18. If a cheetah runs at 70 miles per hour, and a specific race car travels 3520 yards a minute, how much longer, in minutes, would it take the cheetah to travel a distance of 30 miles? **Express your answer as a decimal to the nearest tenth of a minute.**

Washington State Math Championship – 2009
Individual – 5ᵗʰ and 6ᵗʰ Grade

WASHINGTON STATE
MATH CHAMPIONSHIP

√2009

BLAINE SCHOOL DISTRICT
ConocoPhillips
Ferndale Refinery

19. Johan and Marie each run a lawn mowing business, charging $10 and $15 per hour, respectively. Johan can mow an average lawn in one hour and Marie can mow an average lawn in 40 minutes. If Johan and Marie decide to team up and mow an average lawn together, still charging their initial rates, how much money, in dollars, will it cost **in total** to pay them for the job?

20. Solve for x in the following equation: $3 - \dfrac{5x}{6} = 18$.

21. If you write out the numbers 1 through 600, how many digits will you have written?

22. A tank with base dimensions twelve inches by eight inches and height ten inches is filled halfway with water. When a block with volume 240 cubic inches is fully submerged in the water, how high, in inches, will the water rise inside the tank?

23.   What is the seventh term in the following sequence?

1/3, 1/2, 3/4, 9/8, 27/16…

24. How many three-digit palindromes are there?

25. Suppose you surveyed your friends, asking which of them own cats and which own dogs. You found that one-tenth of them only own a cat, one-fifth of them own only a dog, and one-half own both. What fraction of your friends own neither a cat nor a dog?

26. A woman driving a car down a secret road is hoping to drive by three sensors undetected. If the first sensor detects objects 80% of the time, the second sensor detects objects 70% of the time, and the third sensor detects objects 90% of the time, what is the probability that none of the sensors will detect the car? **Express your answer as a reduced fraction**

27. What is the measure, in degrees, of each angle of a regular hexagon?

28. The distance from ex-planet Pluto and our home of Earth is approximately 2.7 billion miles. How many miles would 2 million round trips from Earth to Pluto take? **Express your answer in scientific notation.**

29. What is the units digit of 2009^{2009}?

30. Seven friends are playing a different kind of follow-the-leader game where a group of three must be chosen, and the rest of the friends have to mimic as many of the moves as possible. How many unique sets of three leaders are possible? (Note that friends A, B, and C would be the same set of leaders as B, C, and A.)