



## Junior High Sprint Round 11011

---

### Problems 1-30

Name \_\_\_\_\_

School \_\_\_\_\_

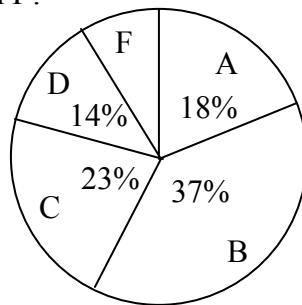
Grade: \_\_\_\_\_ Score: \_\_\_\_\_

Scorer's Initials: \_\_\_\_\_ Scorer's Initials: \_\_\_\_\_

## **DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO**

This round of the competition consists of 30 problems. You will have 40 minutes to complete the problems. You are not allowed to use calculators, slide rules, books, or any other aids during this round. If you are wearing a calculator wrist watch, please give it to your proctor now. Calculations may be done on scratch paper. All answers must be complete, legible, and simplified to lowest terms. Record only final answers in the blanks in the righthand column of the competition booklet. If you complete the problems before time is called, use the remaining time to check your answers.

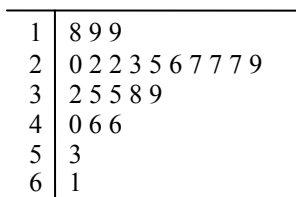
1. Tires cost \$85 each and hubcaps cost \$30 each. If a taxi company wants to buy 3 tires and 12 hubcaps, how much will it cost? 1. \_\_\_\_\_
2. A cookie recipe calls for  $\frac{3}{4}$  cup of sugar in order to make 2 dozen cookies. How many cups of sugar will be needed in order to make 180 cookies? Express your answer as a common fraction. 2. \_\_\_\_\_
3. The pie chart below shows the percentage of students who received each letter grade on the first chemistry test. What percentage of students received an F? 3. \_\_\_\_\_



4. Caroline wants to save at least 5% of her monthly paycheck. In order to do this, she can spend at most \$2090 from it. How much money does Caroline earn each month? 4. \_\_\_\_\_
5. What is the area of a right triangle with hypotenuse of length 10 and one leg of length 8? 5. \_\_\_\_\_
6. A dog and a cat weigh as much as ten hamsters, while two dogs weigh as much as three cats. A cat weighs as much as how many hamsters? 6. \_\_\_\_\_
7. It takes 3 kg of cement to make a cubic meter of concrete. If Peter needs to make a slab of concrete that is 8 meters long, 4 meters high and 0.5 meters thick, how many kilograms of cement will he need? 7. \_\_\_\_\_
8. For a field trip, a school must have at least one chaperone for every 8 students. What is the minimum number of chaperones needed for a field trip with 68 students? 8. \_\_\_\_\_
9. A cell phone plan costs \$24 for the first 400 minutes and \$0.06 for each additional minute. If Anne uses 462 minutes, how much will she have to pay? 9. \_\_\_\_\_
10. Samantha's average score on the first four math tests was 90 points. How many points does she need on the fifth test to get an average of 93 points? 10. \_\_\_\_\_

11. What is the sum of the greatest common factor and the least common multiple of 36 and 54? 11. \_\_\_\_\_

12. The stem and leaf plot below shows the ages of the players on Cara's softball team. What is the mode of the ages? 12. \_\_\_\_\_



13. If the lines  $2x - y = 12$  and  $3x + y = 15$  intersect at the point  $(a, b)$ , what is the value of  $a - b$ ? Express your answer as a common fraction. 13. \_\_\_\_\_

14. By definition,  $(g \circ f)(x) = g(f(x))$ . If  $f(x) = x^3 - 1$  and  $g(x) = 1/x^2$ , then what is the value of  $(g \circ f)(2)$ ? Express your answer as a common fraction. 14. \_\_\_\_\_

15. If Franklin selects one of the 40 smallest prime numbers at random, what is the probability that it is less than 30? Express your answer as a percent. 15. \_\_\_\_\_

16. Troy has 8 white socks and 6 blue socks in a drawer. If he chooses socks at random, how many does he need to pick in order to guarantee that he gets at least one of each color? 16. \_\_\_\_\_

17. 13 students at Samford Middle School play tennis, while 28 students play basketball. If 39 students play at least one of the two sports, how many play both? 17. \_\_\_\_\_

18. How many different products can be made from two distinct elements of the set  $\{2, 4, 8, 16, 32\}$ ? 18. \_\_\_\_\_

19. What is the area of the region which satisfies the inequality  $|x| + |2y| \leq 12$ ? 19. \_\_\_\_\_

20. Cone A has a radius of 3. Cone B has a height of 8 and a volume of  $96\pi$ . If the two cones are similar figures, what is the volume of cone A? Express your answer in terms of  $\pi$ . 20. \_\_\_\_\_

21. Aaron, Becca and Carter split their bill at a restaurant in a 4:3:2 ratio, respectively. If they spent a total of \$54.18 at the restaurant, how much money did Becca spend? 21. \_\_\_\_\_

22. What is the smallest positive integer with more than 4 factors? 22. \_\_\_\_\_

23. Tristan started a book for school by reading  $x$  pages on the 1<sup>st</sup> day. Every day after that, he read half as many pages as he had read in all of the previous days combined. If he had read 243 pages by the end of the 5<sup>th</sup> day, what is the value of  $x$ ? 23. \_\_\_\_\_
24. The measures of the interior angles of a hexagon form an arithmetic sequence. If the smallest angle is  $104^\circ$ , what is the measure of the largest angle, in degrees? 24. \_\_\_\_\_
25. Six people are waiting in line for movie tickets. If Craig isn't at the beginning or the end of the line, how many different orders could the line have? 25. \_\_\_\_\_
26. What is the product of the solutions to the equation  $2x^3 - 5x^2 - 4x + 3 = 0$ ? Express your answer as a common fraction. 26. \_\_\_\_\_
27. The repeating decimal  $0.1292929\dots$  is equivalent to what common fraction? 27. \_\_\_\_\_
28. Kevin flips a fair coin 9 times. What is the probability that he gets more heads than tails? Express your answer as a common fraction. 28. \_\_\_\_\_
29. A pyramid has a square base and sides which are equilateral triangles. If the base has side length 4, what is the surface area of the pyramid? Express your answer in simplest radical form. 29. \_\_\_\_\_
30. A stamp for mailing a letter costs 42¢. How many different ways are there to pay for a stamp using a combination of pennies, nickels and dimes? You do not need to use all three types of coin. 30. \_\_\_\_\_