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# MATHCOUNTS®

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2011

■ Chapter Competition ■

Sprint Round

Problems 1–30

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Name \_\_\_\_\_

School \_\_\_\_\_

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

This section of the competition consists of 30 problems. You will have 40 minutes to complete all the problems. You are not allowed to use calculators, books or other aids during this round. 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 right-hand column of the competition booklet. If you complete the problems before time is called, use the remaining time to check your answers.

In each written round of the competition, the required unit for the answer is included in the answer blank. The plural form of the unit is always used, even if the answer appears to require the singular form of the unit. The unit provided in the answer blank is the only form of the answer that will be accepted.

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Total Correct	Scorer's Initials

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1. If a woodchuck could chuck 60 pounds of wood in 1.5 days, how many pounds of wood could a woodchuck chuck in 6 days?

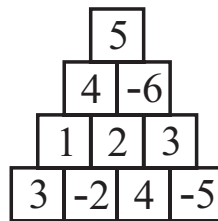


1. \_\_\_\_\_ pounds

2. In degrees Fahrenheit, half the temperature of Papa's oatmeal is equal to 20 degrees cooler than Baby's oatmeal. If Papa's oatmeal is 180 degrees, what is the temperature of Baby's oatmeal?

2. \_\_\_\_\_ degrees

3. Exactly one number is to be selected from each of the four rows of this Number Wall. What is the largest possible product of any such four numbers?

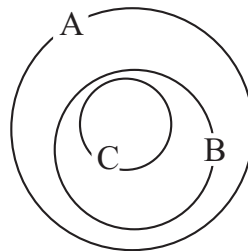


3. \_\_\_\_\_

4. Hannah's number of runs scored in softball this season is 75% of April's number of runs scored this season. If April scored 16 runs this season, how many runs did Hannah score?

4. \_\_\_\_\_ runs

5. A, B and C are circular regions as shown. There are 7 items in circle C. There are exactly 20 items in A and 10 of those items are not in B. How many items are in B, but not in C?



5. \_\_\_\_\_ items

6. A signature line on a certificate is 4 inches long. If Karla wants to leave a  $\frac{3}{4}$ -inch blank space at each end of her signature, how long is the portion of the line on which she can sign her name? Express your answer as a mixed number.

6. \_\_\_\_\_ inches

*Karla Spaghetti*

Karla Spaghetti, Chapter Coordinator

7. Kwanisha defined the operation  $\otimes$  as  $a \otimes b = a^2 + b + 1$ . Using Kwanisha's definition, what is the value of  $6 \otimes 5$ ?

7. \_\_\_\_\_

8. Malton has twice as many moons as Planar. The number of Nero's moons is the cube of the number of Malton's moons. Ufda has 4 more moons than Jir. If you double the number of Nero's moons and add the number of Planar's moons, then you will get the number of Jir's moons. If Planar has 1 moon, how many moons does Ufda have?

8. \_\_\_\_\_ moons



9. The sum of three consecutive prime numbers is 173. What is the largest of these numbers?

9. \_\_\_\_\_

10. If  $(3^x)(9) = 81$ , what is the value of  $x$ ?

10. \_\_\_\_\_



11. If Kenton walks for 60 minutes at the rate of 3 mph and then runs for 15 minutes at the rate of 8 mph, how many miles will he travel?

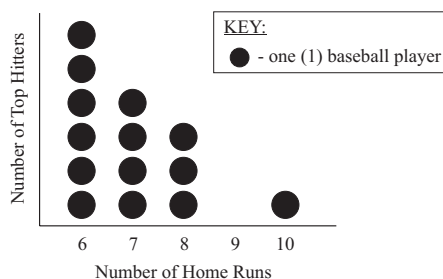
11. \_\_\_\_\_ miles

12. If  $x$  and  $y$  are each integers greater than 3 and less than 20, what is the sum of the three possible values of  $x$  that satisfy the equation  $\frac{x}{y} = \frac{3}{4}$ ?

12. \_\_\_\_\_

13. The graph to the right shows the number of home runs in April for the top hitters in the league. What is the mean (average) number of home runs hit by these players?

Number of Home Runs by Top Hitters in April



13. \_\_\_\_\_ home runs

14. If  $\frac{5}{33}$  is expressed in decimal form, what digit is in the 92nd place to the right of the decimal point?

14. \_\_\_\_\_

15. In a particular game, a player can earn either 3 points or 5 points on each turn. If Capri has earned a total of 18 points, what is the fewest number of turns she could have taken?

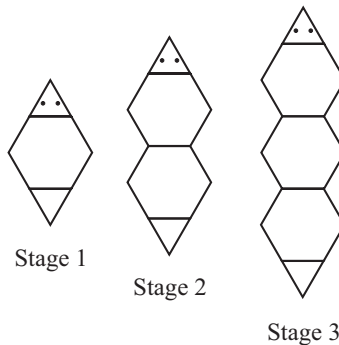
15. \_\_\_\_\_ turns

16. A fonk originally was priced at \$100 when fonks were first introduced. The price of a fonk then increased by 20% once it became popular to own a fonk. Now that fonks are out of style, their price has decreased by 30% from the price when they were popular. This current price of a fonk is what percent of the original price?

16. \_\_\_\_\_ %



17. Growing Worms are created as shown here. Notice that each body segment is a regular hexagon and its head and tail are equilateral triangles. A Stage 1 Growing Worm has a perimeter of 8 cm. What is the perimeter of a Stage 4 Growing Worm?



17. \_\_\_\_\_ cm

18. Each term of a sequence is one more than twice the term before it. If the first term is 1, what is the sum of the first 5 terms of the sequence?

18. \_\_\_\_\_

19. If a fly is buzzing randomly around a room 8 ft long, 12 ft wide and 10 ft high, what is the probability that, at any given time, the fly is within 6 feet of the ceiling? Express your answer as a common fraction.



19. \_\_\_\_\_

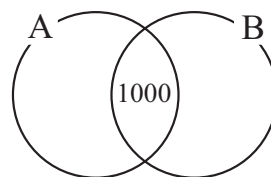
20. If five less than three-fourths of an integer is the same as five more than one-eighth of the same integer, what is the integer?

20. \_\_\_\_\_

21. What is the sum of the negative integers that satisfy the inequality  $2x - 3 \geq -11$ ?

21. \_\_\_\_\_

22. Sets A and B, shown in the Venn diagram, are such that the total number of elements in set A is twice the total number of elements in set B. Altogether, there are 3011 elements in the union of A and B, and their intersection has 1000 elements. What is the total number of elements in set A?

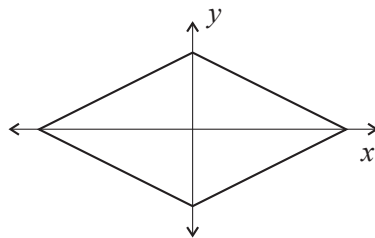


22. \_\_\_\_\_ elements

23. The quotient of two consecutive positive integers is 1.02. What is the sum of these two integers?

23. \_\_\_\_\_

24. What is the area enclosed by the graph of  $|x| + |2y| = 10$  shown here?



24. \_\_\_\_\_ sq units

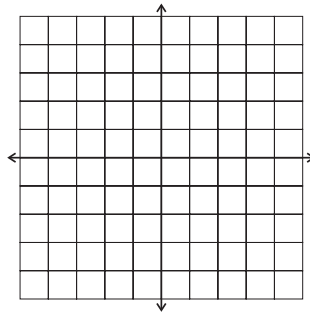
25. Two similar right triangles have areas of 6 square inches and 150 square inches. The length of the hypotenuse of the smaller triangle is 5 inches. What is the sum of the lengths of the legs of the larger triangle?

25. \_\_\_\_\_ inches

26. If a committee of six students is chosen at random from a group of six boys and four girls, what is the probability that the committee contains the same number of boys and girls? Express your answer as a common fraction.

26. \_\_\_\_\_

27. The point  $A(3, 4)$  is reflected over the  $x$ -axis to  $B$ . Then  $B$  is reflected over the line  $y = x$  to  $C$ . What is the area of triangle  $ABC$ ?



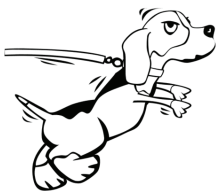
27. \_\_\_\_\_ sq units

28. Tonisha leaves Maryville at 7:15 a.m. headed back to college after summer break. Since she is towing a trailer with all of her belongings, she is limited to an average speed of 45 mph. Her friend Sheila leaves Maryville an hour later taking the same route averaging the speed limit of 60 mph. At what time will Sheila pass Tonisha?



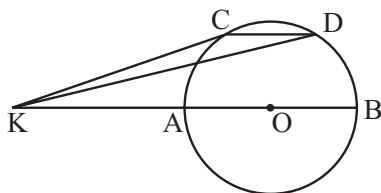
28. \_\_\_\_\_ : \_\_\_\_\_ a.m.

29. Fido's leash is tied to a stake at the center of his yard, which is in the shape of a regular hexagon. His leash is exactly long enough to reach the midpoint of each side of his yard. If the fraction of the area of Fido's yard that he is able to reach while on his leash is expressed in simplest radical form as  $((\sqrt{a})/b)\pi$ , what is the value of the product  $ab$ ?



29. \_\_\_\_\_

30. In the figure, circle  $O$  has radius 6 units. Chord  $CD$  has length 8 units and is parallel to segment  $KB$ . If  $KA = 12$  units and points  $K, A, O$  and  $B$  are collinear, what is the area of triangle  $KDC$ ? Express your answer in simplest radical form.



30. \_\_\_\_\_ sq units