



April 11, 2015

■ RIT Competition ■
Sprint Round
Problems 1-30

Name _____

**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 allowed to use a basic calculator. You are not allowed to use 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.

Total Correct	Scorer's Initials

1. What is the value of $\frac{(16-8)(16+8)}{(4-2)(4+2)}$? 1. _____

2. The gas tank of a car holds 15 gallons, and the car averages 20 miles per gallon. How many miles can the car travel on a full tank of gas? 2. _____ miles

3. What is the arithmetic mean of 87, 78, 95, 84, 100, 92, and 87? 3. _____

4. Evaluate $x - a + 2$; if $x = (a - 3)$ 4. _____

5. How many distinct prime divisors does the number 900 have? 5. _____

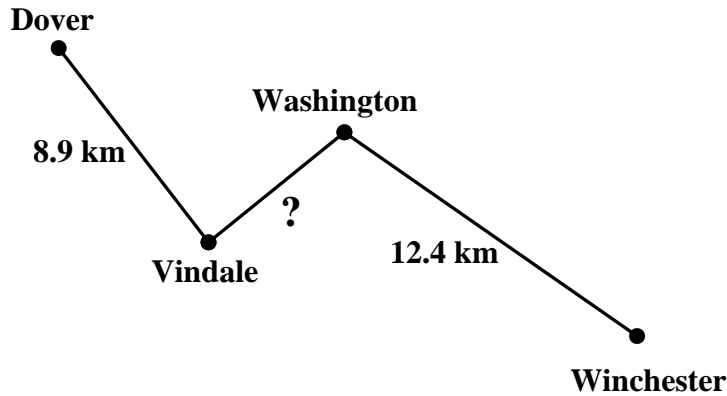
6. What is the value of the expression $[a - (b - c)] - [(a - b) - c]$ when $a = 3$, $b = 5$, and $c = 7$? 6. _____

7. What number comes next in this arithmetic sequence? 7. _____
16, 10, 4, __

8. What is the reciprocal of 3? Express your answer as a common fraction. 8. _____
9. What is 30% of the positive difference between 360 and 500? 9. _____
10. Find the value of n if
 $5000 - n = 991 + 993 + 995 + 997 + 999?$ 10. _____
11. Alicia and her classmates use the Roman numeral MMXIX to represent the year in which they will graduate. What year does this represent? 11. _____
12. On Thursday, 16 of the 80 teachers at Frelich Middle School were absent. What percent of the teachers were present? 12. _____%

13. Using the paths shown below, the distance from Dover to Winchester is 28.2 kilometers. How far is it from Vindale to Washington in kilometers?

13. _____ km



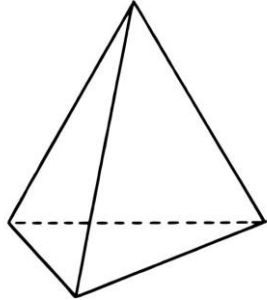
14. What is the area of a square that has a perimeter of 56 ft?

14. _____ sq. ft

15. Buddy multiplied his magic number by 14 and then added 8. The result was 50. What is the magic number?

15. _____

16. The figure shows a regular tetrahedron, in which all of its four faces are equilateral triangles. The sum of the lengths of the edges of the tetrahedron is 96 cm. What is the length, in centimeters, of one edge?



17. The sum of five consecutive integers is -5. What is the least integer?

18. M is the midpoint of \overline{AB} . The length of \overline{AB} is 7 units. What is the length, in units, of \overline{MB} ? Express your answer as a decimal to the nearest tenth.

19. What is the area of a rectangle whose length is four inches and whose width is $\frac{1}{2}$ foot? Express your answer in square inches.

20. There are 36 pencils and pens in a box. The ratio of pencils to pens is 5:4. How many pencils are in the box?

16. _____cm

17. _____

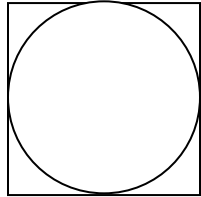
18. _____units

19. _____ sq. in

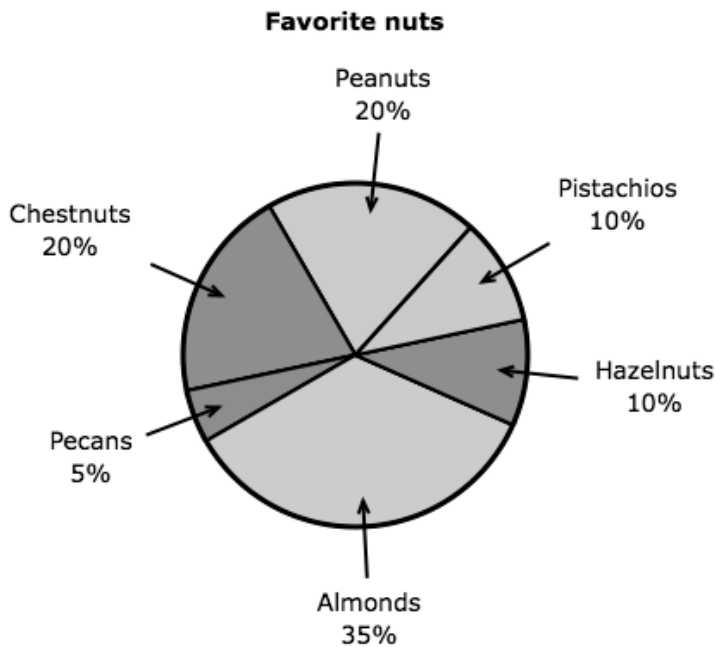
20. _____

21. Two percent of a half a number is 10. What is the number? 21 _____

22. A circle is inscribed in a square whose side length is 10 cm. What is the area of the circle? Express your answer in terms of π . 22. _____ sq. cm



23. The visitors to a certain website were asked to vote on their favorite nuts. Find the measure of the central angle of the "Peanuts" section? 23. _____ degrees



24. How many whole numbers are between $\sqrt{7}$ and $\sqrt{77}$? 24. _____

25. The sum of two numbers is 22. Their difference is 4. What is the greater of the two numbers?

25. _____

26. The measure of an angle is 64° . Find the measure of its supplementary angle.

26. _____degrees

27. A personal trainer recorded how many laps each of her players ran last week. How many players ran at least 3 laps?

27. _____

Running laps	
Laps run	Frequency
0	8
1	19
2	13
3	14
4	7
5	3

28. An integer n is a nifty number if both $n + 1$ and $\frac{1}{2}n + 1$ are perfect squares. What is the largest nifty number less than 100?

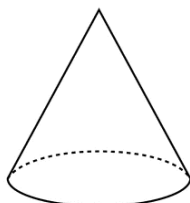
28. _____

29. The volume of a cylinder is $54\pi \text{ cm}^3$. What is the volume of a cone with the same radius and height as the cylinder in cubic centimeters? Express your answer in terms of π .

29. _____ cu. cm



$$V = \pi r^2 h$$



$$V = \frac{1}{3} \pi r^2 h$$

30. If the area of the shaded region is 6 square units, what is the area of triangle DBC in square units?

30. _____ sq. units

