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# MATHCOUNTS<sup>®</sup>

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2005

■ **School Competition** ■

**Team Round**

**Problems 1–10**

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

This section of the competition consists of ten problems which the team has 20 minutes to complete. Team members may work together in any way to solve the problems. Team members may talk during this section of the competition. This round assumes the use of calculators, and calculations may also be done on scratch paper, but no other aids are allowed. All answers must be complete, legible and simplified to lowest terms. The team captain must record the team's official answers on his/her own problem sheet, which is the only sheet that will be scored. If the team completes the problems before time is called, use the remaining time to check your answers.

Team  
Members \_\_\_\_\_, Captain

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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Total Correct	Scorer's Initials

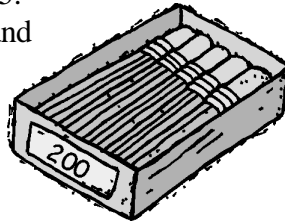
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1. An assortment of 200 pencils is sold through a catalog for \$19.90. Shipping is an additional \$6.95. Including the charges for both the pencils and the shipping, what is the average cost, in cents, for each pencil? Express your answer to the nearest whole number.



1. \_\_\_\_\_ cents

2. Nanette rounds **10.68494** to the nearest hundredth. Duane rounds **10.68494** to the nearest whole number. What is the positive difference between their two answers? Express your answer as a common fraction.

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

3. One tablet of calcium contains 25% of the recommended daily dose for an adult. A bottle of calcium tablets contains 500 tablets. Mrs. Marsh gets 25% of her calcium from her diet and the rest of her calcium from the tablets. If Mrs. Marsh gets exactly 100% of the recommended daily dose of calcium each day, how many full weeks will one bottle last?

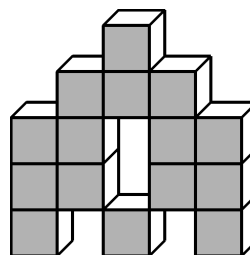


3. \_\_\_\_\_ full weeks

4. The decimal point of a positive real number is moved two digits to the right to form a different real number. When the positive difference between these two real numbers is divided by 11, the answer is 21. What is the original real number? Express your answer as a common fraction.

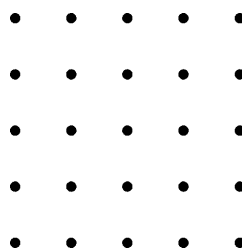
4. \_\_\_\_\_

5. What is the total surface area of the figure to the right formed by 15 unit cubes?



5. \_\_\_\_\_ sq units

6. How many different lines contain three or more points of this square 5 by 5 grid?



6. \_\_\_\_\_ lines

7. Tim wants to create a circle graph showing the number of physicians whose specialty is aerospace medicine. He knows the following information.

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

**Aerospace Medicine Physicians (1997)**

Age of Physician	# of Males	# of Females
Under 35 years	53	8
35 - 44 years	155	17
45 - 54 years	145	10
55 years and over	98	2

If he wants to include each of the eight groups in his graph, how many degrees would he use for the central angle of the “45 – 54 year-old Males” sector? Express your answer to the nearest whole number.

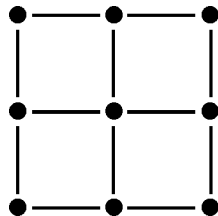
8. The sequence below is formed by repeating the letters of the alphabet, in order, the same number of times as the letter’s ordinal position in the alphabet. After 26 Z’s, the sequence starts over with ABBCCC.... What is the 2005<sup>th</sup> letter in the sequence?

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

A B B C C C D D D D E E E E E ....

9. In this 2 by 2 grid of squares, the total length of all 12 of the line segments is 12 units. In a similar 40 by 40 grid of squares that are the same size, what is the total length of all of the line segments?

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



10. In a 10-kilometer race, each runner runs 5 km to point P and returns to the start by the same route. Ian runs 4 kilometers per hour faster than Sean. Ian runs to point P, turns around, and meets Sean 4 km from the start. Assume that Ian and Sean each maintain a constant speed and start at the same time. What is Sean’s time, in minutes, for running the 10 kilometers?

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