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# MATHCOUNTS®

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2007

■ 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 10 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 to each other 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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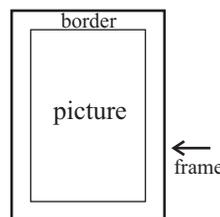
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1. When a car's brakes are applied, it travels 5 feet less in each second than the previous second until it comes to a complete stop. A car goes 35 feet in the first second after the brakes are applied. How many feet does the car travel from the time the brakes are applied to the time the car stops?

1. \_\_\_\_\_ feet

2. A 4-inch by 6-inch picture is enlarged for framing by tripling its dimensions. A 2-inch-wide border is then placed around each side of the enlarged picture, as shown. Thin metal framing is sold only in increments of one foot. What is the minimum number of linear *feet* of framing that must be purchased to go around the perimeter of the border?



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

3. A silent auction was held at Little M.S. and some of the data are given below. Some of the digits of the bids were smudged, so each smudged digit has been replaced by an underlined asterisk. In a silent auction, the successive bidders outbid the earlier bidders. All bids are in whole numbers of dollars. At the end of the bidding period, the last (and therefore highest) bidder gets the item for the price bid. What is the smallest total amount that could have been paid for these four items?

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

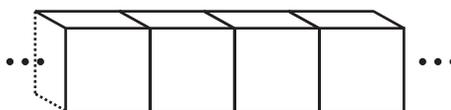
Necklace	Las Vegas Trip	Ski Passes	Autographed Football
Mike \$12	Lou \$100	Mike \$30	Jill \$15
Angie \$**	Jill \$*10	Pat \$36	Mike \$*5
	Jack \$*10	Andrew \$3*	

4. Alec must purchase 14 identical shirts and only has \$130. There is a flat \$2 entrance fee for shopping at the warehouse store where he plans to buy the shirts. The price of each shirt is the same whole-dollar amount. Assuming a 5% sales tax is added to the price of each shirt, what is the greatest possible price of a shirt that would allow Alec to buy the shirts?

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

5. One micron is 0.001 mm. A certain cell is a cube with edge length five microns. How many cells would have to be lined up face-to-face to be one mm across?

5. \_\_\_\_\_ cells



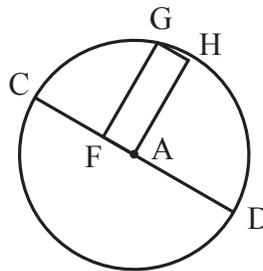
6. The Charleston Dodgeball Team has 16 players at a tournament match. If each player is equally likely to be chosen as one of the 10 starters, what is the probability that the Charleston player Joe “The Arm” Morez will start? Express your answer as a common fraction.

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

7. A regular hexagon is inscribed in a circle with a two-inch radius. What is the side length of a square with the same area as the hexagon? Express your answer as a decimal to the nearest hundredth.

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

8. In the circle shown, with center at point A, rectangle AFGH has  $AF = 7$  units and  $AH = 24$  units. Points A, C, D, F, G and H are all in the same plane, and points C, D and G are on the circle. What is the length of segment CF?



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

9. I have two one-quart jars; the first is filled with water, and the second is empty. I pour half of the water in the first jar into the second, then a third of the water in the second jar into the first, then a fourth of the water in the first jar into the second, then a fifth of the water in the second jar into the first, and so on. How much water is in the first jar after the 10<sup>th</sup> pour? Express your answer as a common fraction.

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

10. A basement has a 24-foot by 32-foot rectangular floor. The basement is flooded with water to a depth of 18 inches. Three pumps are used to pump the water out of the basement. Each pump will pump 8 gallons of water per minute. If a cubic foot of water contains 7.5 gallons, how many minutes will it take to pump all of the water out of the basement using the three pumps?

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