MATHCOUNTS®

2006
■ School Competition ■
Target Round
Problems 1 and 2

Name _____

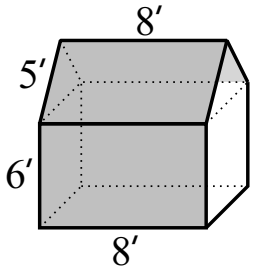
DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This section of the competition consists of eight problems, which will be presented in pairs. Work on one pair of problems will be completed and answers will be collected before the next pair is distributed. The time limit for each pair of problems is six minutes. The first pair of problems is on the other side of this sheet. When told to do so, turn the page over and begin working. Record only final answers in the designated blanks on the problem sheet. All answers must be complete, legible and simplified to lowest terms. This round assumes the use of calculators, and calculations may also be done on scratch paper, but no other aids are allowed. If you complete the problems before time is called, use the time remaining to check your answers.

Total Correct	Scorer's Initials

1. Sandy's daughter has a playhouse in the back yard. She plans to cover the one shaded exterior wall and the two rectangular faces of the roof, also shaded, with a special siding to resist the elements. The siding is sold only in 8-foot by 12-foot sections that cost $27.30 each. If Sandy can cut the siding when she gets home, how much will it cost for the siding Sandy must purchase?

1. $_____



2. The charts represent charges for a package shipped within the United States by two carriers. Sarah wishes to send a package to her aunt who lives in Zone 7. The package weighs 20 ounces, and there are 16 ounces in one pound. If Carrier A rounds the final cost up to the next penny, how much does Sarah save by using Carrier A instead of Carrier B?

2. $_____

CARRIER A

Package Weights	**Rate for first ounce (or fraction thereof)**	**Rate for each additional ounce (or fraction thereof)**
Up to 2 ounces	$0.352	$0.225
More than 2 ounces	$0.311	$0.225

CARRIER B

Zones	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Up to 1 lb	$6.25	$6.40	$6.75	$6.85	$7.15	$7.20	$7.35
Up to 2 lbs	$6.35	$6.65	$7.20	$7.35	$7.80	$7.95	$8.35
Up to 3 lbs	$6.50	$6.85	$7.50	$7.75	$8.20	$8.45	$9.10
Up to 4 lbs	$6.65	$7.15	$7.85	$8.15	$8.60	$8.85	$9.60

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Problems 3 and 4

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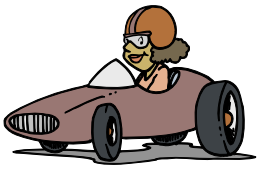
3. A car drives in a circular path with a diameter of 1200 feet. If the car completes exactly two laps each minute, what is the car's speed, in feet per second? Express your answer to the nearest whole number.



3. _____ feet per sec

4. When the temperature goes up 3˚ on the Cantor scale, it goes up 8˚ on the Frobenius scale. On both scales, 18˚ is the same temperature. How many Frobenius degrees are equal to 30˚ Cantor?

4. _____ ˚ Frobenius

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Target Round
Problems 5 and 6

Name _____

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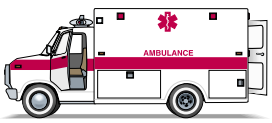
5. Sam the Sham is an unfair shoe salesman. He has a pair of shoes that was priced at $60 last week. To entice customers, he wants to put a "25% off" tag on the shoes but he still wants the customer to pay $60 for the shoes. He raises the price of the shoes so that after the 25% discount the shoes will cost $60. What must the new price of the shoes be before the discount?

5. $ _____

6. An ambulance travels at 40 mph and can follow a 20-mile route making no stops to get to the hospital. A helicopter travels at one mile per minute, and the air route is 15 miles to get to the same hospital. However, the helicopter takes three minutes for take off and three minutes for landing. How many fewer minutes does it take for the helicopter to complete its trip (take off, flight and landing) than for the ambulance to complete its trip?

6. _____ minutes



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2006
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Target Round
Problems 7 and 8

Name _____

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7. What integer is tripled when nine is added to three-fourths of it?

7. _____

8. The figure below consists of four semicircles and the 16-cm diameter of the largest semicircle. What is the total area of the two shaded regions? Use 3.14 as an approximation for π, and express your answer as a decimal to the nearest tenth.

8. _____ sq cm