Bull's-eye, Page 1: Problem Solving

1. The cost of a cell phone contract is \$35 for any number of monthly minutes up to 400, and 25 cents for every minute beyond 400 minutes. Alicia's cell phone bill for last month was \$335. How minutes in total did she use the phone last month?

1. _____ minutes

2. Alan, Beti, and Cecil were the only people who baked cookies for a bake sale. Alan baked 32 cookies fewer than one-half of the cookies. Beti baked 24 cookies fewer than one-third of the cookies. Cecil baked 8 cookies more than one-quarter of the cookies. How many cookies were baked in total?

2. _____ cookies

3. In the country of Cascadia, 10% of the people are rich, and 90% are poor. Between them, the rich own 90% of the wealth of Cascadia, and the poor own the remaining 10%. If P is the mean wealth of a poor person, and R is the mean wealth of a rich person, what is the value of P/R? Express your answer as a common fraction.

3. _____ percent

4. At a large school, 110 students were absent on Monday, 100 were absent on Tuesday, and 90 were absent on Wednesday. In total, there were 170 students who were absent for at least one of these three days. What is the largest number of students who could have been absent for *every one* of these three days?

4. _____ students

Bull's-eye, Page 2: Combinatorics and Numbers

5. How many positive integers divide 2008? 5. _____

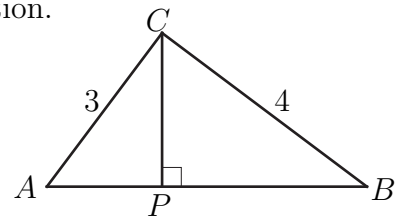
6. How many 3-digit numbers have digit sum equal to 24? 6. _____ numbers

7. The positive difference of two perfect squares is 32. What is the largest possible value of the sum of the two perfect squares? 7. _____

8. How many strictly increasing sequences of positive integers begin with 1 and end with 7? Two such sequences are 1, 7 and 1, 4, 6, 7. 8. _____

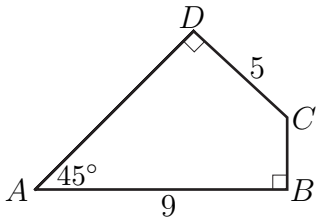
Bull's-eye, Page 3: Geometry

9. Triangle ABC has a right angle at C. Side CA has length 3, and side CB has length 4. Point P on AB is such that CP is perpendicular to AB. What is the ratio of the length of AP to the length of PB? Express your answer as a common fraction.



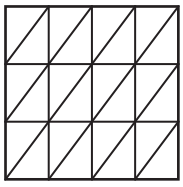
9. _____

10. In the quadrilateral $ABCD$, the angle at A is 45°, and the angles at B and D are right angles. Side AB has length 9 cm, and side CD has length 5 cm. What is the area of the quadrilateral $ABCD$?



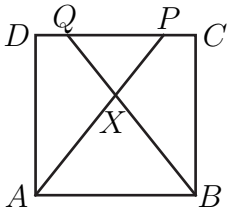
10. _____ cm^2

11. A cake has the shape of a rectangular prism (box) with a 24 cm by 24 cm square base, and a height of 5 cm. The cake is cut into 24 identical wedges (triangular prisms) by making straight up and down cuts, as in the picture below, which shows the pattern of the cuts on the top of the cake. What is the *full* surface area of an individual wedge?



11. _____ cm^2

12. In the picture below (which is not drawn to scale), $ABCD$ is a square of side 1 unit, and P and Q are on the line segment CD, with $CP = DQ < 1/2$. Lines AP and BQ intersect at X. Given that triangle ABX has area $2/7$ units^2, what is the area of quadrilateral $BCPX$? Express your answer as a common fraction.



12. _____ units^2