

This exam has 5 questions, for a total of 100 points.

Write your answers in the Blue Book. Print your names & write the number of students taking this test in the upper right corner of the Blue Book. Put the test and the Blue Book in the provided envelope.

1. (20 points) Harold tosses a coin 4 times. What is the probability that he gets at least as many heads as tails?

2. (20 points) The principal of Nick Middle School asks the president of the Math Club how many students are members of that great, exciting club? The president replies 'twice our number plus half our number plus one quarter of our number plus you is one hundred.'
 The principal, who is a math wiz, replies 'Great, so the number in the math club is exactly one more than one eighth of the total student enrollment at Nick Middle School!'
 How many students are in the Math Club? Explain how you found your answer.
 What is the total enrollment at Nick Middle School? Explain how you found your answer.

3. (20 points) I promised not to tell, but secrets are no fun unless you share them with your friends. On Monday morning, which was January 1, 2005, I learned a big secret and I told 2 friends early Tuesday morning, but I have never told anyone else, I swear! Each of my friends tells two people, all different, early Wednesday and then never tells another. They swear! If this continues what is the earliest date that more than 100 people will know the secret? more than 1,000,000?

4. (20 points) A circle is inscribed in a semicircle. The diameter of the circle and the radius of the semicircle are 12 cms. What is the area of the region of the semicircle that is outside the circle? Be sure to use appropriate units to express your answer.

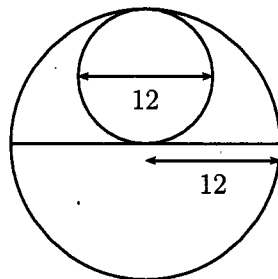


Figure for Problem 4

5. (20 points) A rectangle is divided into four rectangles with areas 45, 25, 15 & x . Find x .

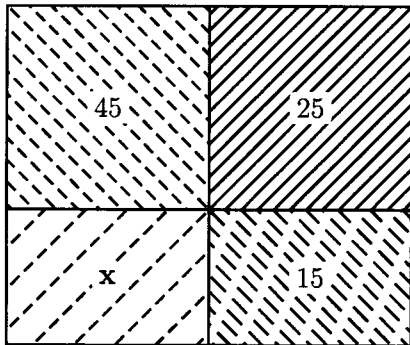


Figure for Problem 5