# Team Test

The team test has 12 "free" questions, meaning they are all independent and stand alone. The last 3 questions, however, use the answers from the previous 12 questions as values in the problem, and are worth more points. In questions #13-15, a number referred to as [Px] is referring to the answer of the xth question. For instance, [P11] is the answer to the 11th question. Good luck!

1. (3) 15 years ago, Annie's grandmother was three times the age of Annie's father, who in turn was three times the age of Annie. Annie is 88 years younger than her grandmother. How old is Annie today?

2. (3) A 12"-diameter pizza is cut into 6 congruent slices while a 16"-diameter pizza is cut into 8 congruent slices. Quinn ate 3 slices of the 16" pizza while Andreas ate 3 slices of the 12" pizza. How many more square inches of pizza than Andreas did Quinn eat? This value can be expressed in the form $a\pi$; what is a?

3. (3) Insanity affects 1% of the population. The Legallo-Ravichandran Insanity Test is 90% accurate. If the test declares you insane and they throw you in a straight-jacket, what is the probability that you're sane after all? This probability can be expressed as a fraction in the form $\frac{a}{b}$; concatenate ab.

4. (4) M is the midpoint of ST in regular pentagon PQRST. What is the measure of <MQS?
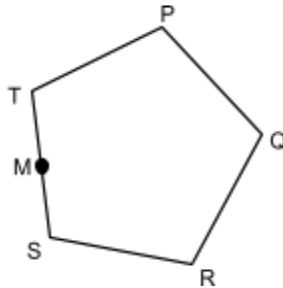
5. (4) In the rectangular 4 by 4 grid below, horizontally and vertically adjacent dots are 1 unit apart. Using the grid points as endpoints, there are *n* segments, each with a different length. What is the median length of these *n* segments? This length can be expressed in the form $\sqrt{a}$; what is *a*?
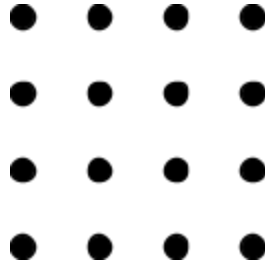
6. (4) A soda company sells its product in either a 20-ounce bottle or a 12-ounce can. It charges $1.50 for the 20-ounce size. How much should they charge, in cents, for the can if they want the price per ounce to be 30% more than the price per ounce of the larger size?

7. (4) A data set of ages lists the ages of a class of 20 eighth graders as integer values of either 13 or 14. The median age in the data set is 0.35 years less than the mean. How many 13-year-olds are in the class?

8. (4) The positive 3-digit integer K gives a perfect square when divided by 4 and gives a perfect cube when divided by 9. What is the value of K?

9. (4) 5 couples are at a party. 4 people of the 10 are randomly selected to win a prize. What is the probability that both members of at least one couple win a prize? This probability can be expressed as a fraction in the form $\frac{a}{b}$; concatenate ab.

10. (5) A wall made of a certain number of rows consisting of cube-shaped bricks starts with a row of 23 bricks at the bottom. Each row has 4 fewer bricks than the row below it. Ishpreet noticed that the total number of bricks used in the wall is enough to create a rectangular brick floor that is one layer of bricks thick, 3 times as long as it is wide. How many rows of bricks does the wall have?

11. (5) Two circles, one of radius 3 inches, the other of radius 5 inches, are tangent at point T. Two bugs start flying at the same time from point T, one flying around the larger circle at 3π inches per second while the other flies around the smaller circle at 2π inches per second. How many seconds from the time they start until their next meeting at point T?

12. (5) The sum of five positive integers that form an arithmetic sequence is 65. Of all such possible sequences, what is the greatest possible fourth term?

13. (7) The quantity ([P9] + [P10] - 2) people are seated around a circular stadium. Each person

is either a Patriot, who always tells the truth, or a Warrior, who always lies. If each person in the stadium says that the person to their right is a Warrior, how many Warriors are seated in the stadium?

14. (7) The area of the shaded region is ([P4] * [P5] -45) square units. All angles are right angles. What is the perimeter of the non-shaded region (the outlined one with the 6 in it)?
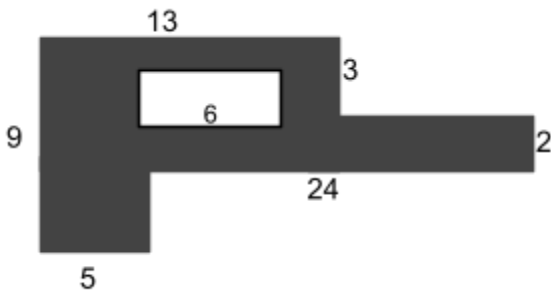
15. (7) What is the value of the units digit of $3^{[P7]*2 - 2} + 6^{[P1]}$?