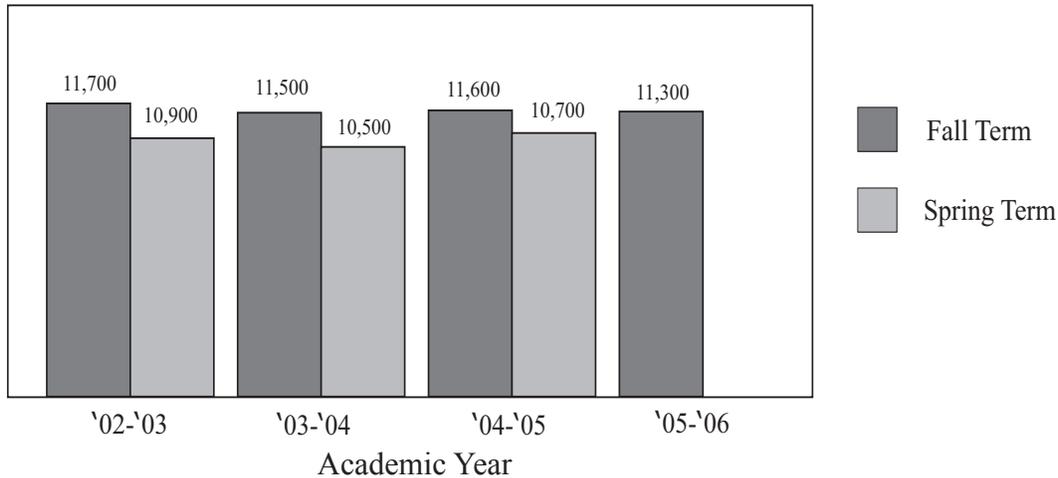


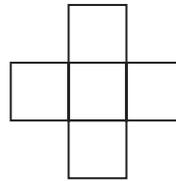
1. What is the average student headcount for the spring terms of the '02-'03, '03-'04 and '04-'05 academic years? Express your answer to the nearest whole number.

1. \_\_\_\_\_ students

**Total Student Headcount (2002-2003 to 2005-2006)**



2. Each of the five numbers 1, 5, 9, 13 and 17 is placed in one of the five squares so that the sum of the three numbers in the horizontal row equals the sum of the three numbers in the vertical column. What is the largest possible sum of the three numbers in the horizontal row?



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

3. Angie decided to use her class as a sample to predict the total number of students in her school wearing red on Valentine's Day. She counted 11 students wearing red in her class of 24 students. Using this ratio, how many of the 480 students in her school will she estimate are wearing red?



3. \_\_\_\_\_ students

4.  Erik can set up and burn a single CD on his computer in 3.5 minutes. At this rate, how long will it take Erik to set up and burn 20 of this same CD?

4. \_\_\_\_\_ minutes

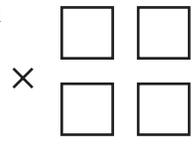
5. At a local restaurant, appetizers range in price from \$5.45 to \$12.75, entrees range in price from \$10.50 to \$22.50, and desserts range in price from \$6.25 to \$10.50. Assuming a meal consists of exactly one item from each of these three categories, what is the least expensive meal possible?

5. \$ \_\_\_\_\_

6. Tom's mathematics test had 60 questions: 10 arithmetic questions, 30 algebra questions and 20 geometry questions. Although he correctly answered 70% of the arithmetic questions, 50% of the algebra questions and 50% of the geometry questions, he did not pass the test because he got fewer than 60% of the questions right. How many more questions would he have needed to answer correctly to earn a passing grade of 60%?

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

7. Use each of the digits 3, 4, 5 and 8 exactly once such that each square contains one digit and the largest possible product is made. What is the product?



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

8. The sum of three positive integers is 20. If the smaller two integers differ by five, what is the smallest possible value of the largest integer?

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

9. Sugar can be purchased in either 3-pound or 5-pound bags. A 3-pound bag of sugar costs \$2.10 while a 5-pound bag costs \$3.39. When spending the least amount of money possible to purchase exactly 34 pounds of sugar, how many 5-pound bags of sugar will be purchased?



9. \_\_\_\_\_ 5-pound bags

10. A triangle has three different integer side lengths and a perimeter of 20 units. What is the maximum length of any one side?

10. \_\_\_\_\_ units

11. For how many integer values of  $M$  is  $\frac{M}{30}$  strictly between  $\frac{1}{3}$  and  $\frac{3}{5}$ ?

11. \_\_\_\_\_ values

12. Alex, Bing, Cara, Dan and Earl are people playing marbles. Alex holds 15 marbles, Bing holds 2 marbles, Cara holds 3 marbles, Dan holds 7 marbles, and Earl holds 8 marbles. What is the least possible number of marbles that must change holders so that each player will hold an equal number of marbles?



12. \_\_\_\_\_ marbles

13. A pen and its ink refill together cost \$1.10. The pen costs \$1 more than the ink refill. What is the cost of the pen?



13. \$ \_\_\_\_\_

14. In quadrilateral ABCD,  $AB = 5$ ,  $BC = 8$  and  $CD = 20$  units. Angle B and angle C are both right angles. What is the length of segment AD?

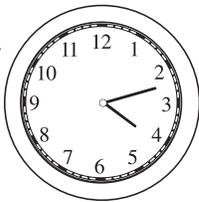
14. \_\_\_\_\_ units

15. The length of the longer side of rectangle R is 10 percent more than the length of a side of square S. The length of the shorter side of rectangle R is 10 percent less than the length of a side of square S. What is the ratio of the area of rectangle R to the area of square S? Express your answer as a common fraction.



15. \_\_\_\_\_

16. On a standard clock, how many degrees does the minute hand rotate during the time period from 4:12 pm to 4:48 pm of the same day?



16. \_\_\_\_\_ degrees

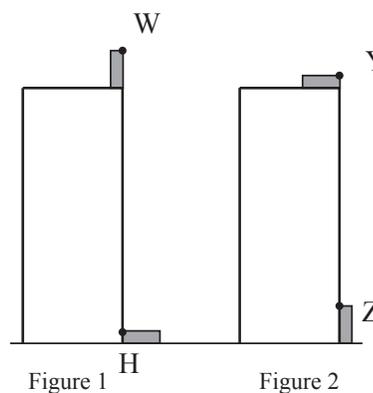
17. A segment has endpoints  $P(1, 1)$  and  $Q(x, y)$ . The coordinates of the midpoint of segment PQ are positive integers with a product of 36. What is the maximum possible value of  $x$ ?

17. \_\_\_\_\_

18. The point at  $(a, b)$  on a Cartesian plane is reflected over the  $y$ -axis to the point at  $(j, k)$ . If  $a + j = 0$  and  $b + k = 0$ , what is the value of  $b$ ?

18. \_\_\_\_\_

19. Two shaded identical rectangular decorative tiles are first placed (one each) at the top and at the base of a door frame for a hobbit's house, as shown in Figure 1. The distance from W to H is 45 inches. Then the same two tiles are rearranged at the top and at the base of the door frame, as shown in Figure 2. The distance from Y to Z is 37 inches. What is the height of the door frame?



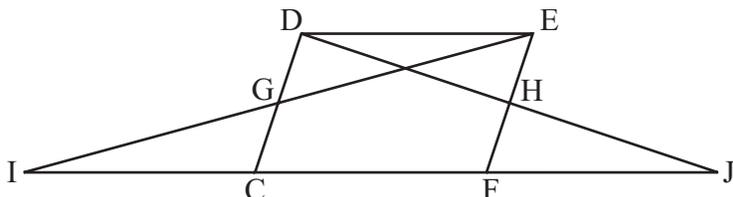
19. \_\_\_\_\_ inches

20. The median of the set  $\{n, n + 5, n + 6, n + 9, n + 15\}$  is 9. What is the mean?

20. \_\_\_\_\_

21. Quadrilateral CDEF is a parallelogram. Its area is 36 square units. Points G and H are the midpoints of sides CD and EF, respectively. What is the area of triangle of CDJ?

21. \_\_\_\_\_ sq units



22. A fair, twenty-faced die has 19 of its faces numbered from 1 through 19 and has one blank face. Another fair, twenty-faced die has 19 of its faces numbered from 1 through 8 and 10 through 20 and has one blank face. When the two dice are rolled, what is the probability that the sum of the two numbers facing up will be 24? Express your answer as a common fraction.

22. \_\_\_\_\_

23. Let  $P = (2 - 3 - 4 + 7)^{2347}$  and  $Q = (-2 + 3 + 4 - 7)^{2347}$ . What is the value of  $(2 + 3 + 4 + 7)^{(P+Q)}$ ?

23. \_\_\_\_\_

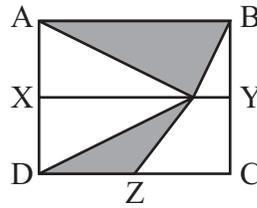
24. For a particular circle, a central angle of  $75^\circ$  will intercept an arc of length  $10\pi$  feet. What is the radius of this circle?

24. \_\_\_\_\_ feet

25. On a True/False test, Amy answered the first three questions wrong but answered the rest of the questions correctly. On the same test, Scott answered exactly two questions wrong. He answered the last question wrong, the 26 questions before it correctly, and the question before that wrong. If Amy and Scott were both incorrect on the same question exactly once, what is the greatest possible percent of the total number of questions that Amy could have answered correctly?

25. \_\_\_\_\_ %

26. Rectangle ABCD has an area of 320 square units. Points X, Y and Z are midpoints of segments AD, BC and CD, respectively. What is the total area of the shaded regions?

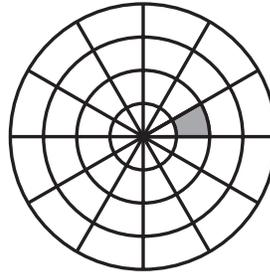


26. \_\_\_\_\_ sq units

27. A jar contains two red marbles, three green marbles, ten white marbles and no other marbles. Two marbles are randomly drawn from this jar without replacement. What is the probability that these two marbles drawn will both be red? Express your answer as a common fraction.

27. \_\_\_\_\_

28. A decorative arrangement of floor tiles forms concentric circles, as shown in the figure to the right. The smallest circle has a radius of 2 feet, and each successive circle has a radius 2 feet longer. All the lines shown intersect at the center and form 12 congruent central angles. What is the area of the shaded region? Express your answer in terms of  $\pi$ .



28. \_\_\_\_\_ sq feet

29. At how many points do the graphs of the equations  $y = x^3$  and  $y = x^2 + 4x$  intersect?

29. \_\_\_\_\_ points

30. If  $\pi = 3.1415926\dots$ , what is the exact value of  $|\pi - 3.14| + |\pi - \frac{22}{7}|$ ? Express your answer as a common fraction

30. \_\_\_\_\_

