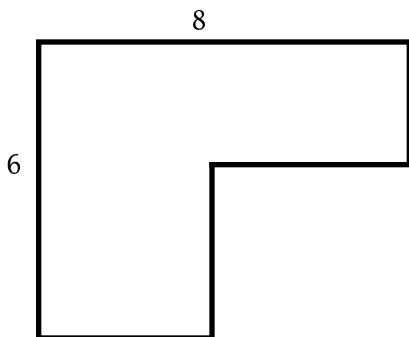


MATH AWARENESS WEEK COMPETITION – SAMPLE PROBLEMS

Department of Mathematics, University of KANSAS

Sample Problems for 5th-6th Grade Examination

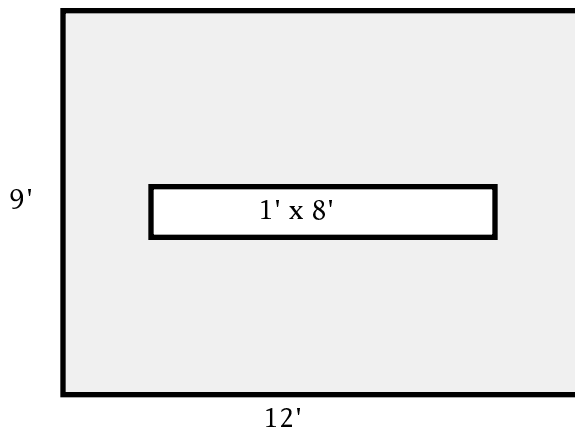
1. How many numbers from 1 to 100 have a figure '5' in them?
2. If you roll two six sided die, what are the chances that your total will be 6? Express your answer as a ratio using ":" sign.
3. A math contest began at noon one day and ended 1000 minutes later. At what time did the contest end?
4. What is the perimeter of the shown polygon?



5. The sale ad read: "Buy three tires at the regular price and get the fourth tire for \$3." Jack paid \$240 for the set of four tires at the sale. What was the regular price of one tire?

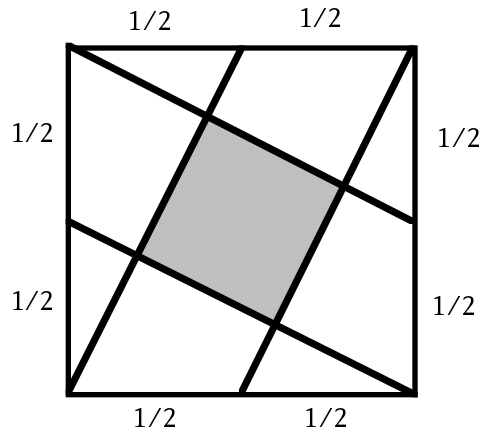
1997 Junior High Examination (7-9th Grades)

1. Mary is 24 years old. She is twice as old as Ann was when Mary was as old as Ann is now. How old is Ann?
2. A circle of diameter 1 is inscribed in a square, dividing it into five regions: the region inside the circle, and a region at each corner. Find the diameter of a circle inscribed in in one of the corner regions.
3. Arrange these numbers in increasing order:
 1^{888} 2^{777} 3^{666} 4^{555} 6^{333} 7^{222} 8^{111}
4. What is the largest product you can get by multiplying together a bunch of positive integers (whole numbers) that add up to 23? (The numbers do not have to be distinct.)
5. A $9' \times 12'$ rug has a $1' \times 8'$ hole in the middle (see figure), leaving it with an area of 100 square feet. Show, by drawing cut lines on the figure below, how the rug can be cut into just two pieces, which can be arranged to cover the floor of a $10' \times 10'$ room.



1997 Senior High Examination (10-12th Grades)

1. If $\sin x = 17 \cos x$, compute $\sin 2x$.
2. Let n be an integer. Show that $(n + 2)(n + 1)n(n - 1) + 1$ is the square of an integer.
3. Start with a unit square. Connect midpoints and vertices as shown in the figure. Find the area of the shaded square.



4. Find what value of n is

$$\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}} + \cdots + \frac{1}{\sqrt{n} + \sqrt{n+1}} = 10?$$

5. Find the real root of the equation $x^3 = x^2 + x + x + \frac{1}{3}$.