

MATHCOUNTS
Team Round
1995-1996

1. A person weighing 120 pounds burns 7.3 cal./min. jogging and 11.3 cal./min running. Kirsten, who weighs 120 pounds, wishes to exercise by jogging and running. She has 40 minutes to exercise and wishes to burn exactly 352 calories. How many minutes should she spend jogging?

1. _____

2. The mean, median, and mode for this set of data are all equal: {30, 80, 40, 50, x}. Find x.

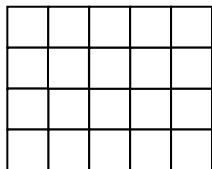
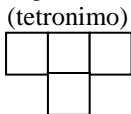
2. _____

3. Compute the sum of a, b, and c, given that $\frac{a}{2} = \frac{b}{3} = \frac{c}{5}$ and $abc = 1920$.

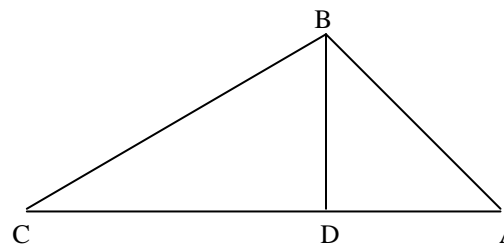
3. _____

4. What is the greatest number of non-overlapping T-shaped tetrominoes, as shown below, that can be entirely placed on the 4 x 5 grid shown; that is, how many can be placed so there is no overlap and no overhang? The small squares are all congruent.

4. _____



5. Given that $\angle ADB \cong \angle CBA$, $AD = 4$, and $CD = 8$, how many units are in the length of \overline{AB} ? Express your answer as a decimal to the nearest tenth.

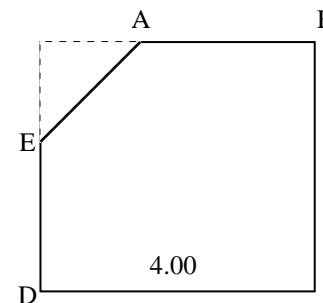


6. The number 210 can be written as the sum of consecutive positive integers in several ways. When written as the sum of the greatest possible number of consecutive integers, what is the largest of these numbers?

6. _____

7. Pentagon ABCDE is formed by connecting A and E, the midpoints of two consecutive sides of a square. What is the sum of the lengths of the diagonals of the pentagon, expressed as a decimal rounded to the nearest tenth?

7. _____



8. What is the value of $\frac{3}{2} + \frac{5}{2} + \frac{7}{2} + \dots + \frac{201}{2}$?

8. _____

9. How many distinct ordered pairs of positive integers (m, n) are there so that the sum of the reciprocals of

9. _____

m and n is $\frac{1}{4}$?

10. This figure has a total area of 108 square units and is a rectangle composed of three congruent, smaller rectangles. Find the sum of the length and width of one of the smaller rectangles.

10.

Express your answer in simplest radical form.

