

Eighth Annual Upper Peninsula High School Math Challenge

Northern Michigan University (Marquette, MI, USA)
Saturday 8 April 2017

Individual Problems

PROBLEM 1

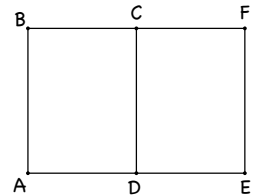
The sum of three numbers is 98. The first number is $\frac{2}{3}$ of the second, and the second is $\frac{5}{8}$ of the third. What is the second number?

PROBLEM 2

Ms. Daniels recorded the test scores for her algebra class of 25 students. The class average on the test was 72. Unfortunately, Samantha's test score of 86 was incorrectly recorded as 36. What was the correct test average?

PROBLEM 3

ABCD and DCFE are coplanar rectangles that share a common side, CD. If $AB = 4$ cm, $AC = 5$ cm, and $BC = CF$, what is the length of AF?

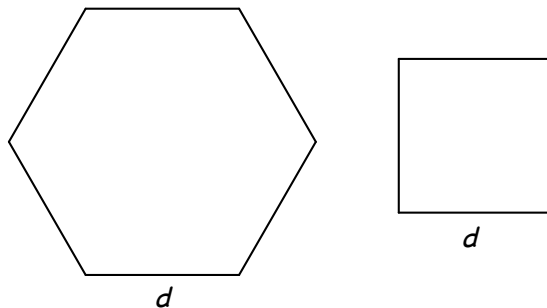


PROBLEM 4

One line has a slope of m and a y -intercept of 2. A different line has a slope of 2 and a y -intercept of m . At what coordinates, in terms of m , must the lines intersect?

PROBLEM 5

A regular hexagon and a square each have a side of length d inches. The area of the hexagon is $384\sqrt{3}$ square inches. What is the area of the square?



PROBLEM 6

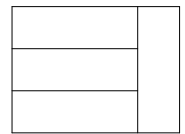
The sum of seven consecutive integers is 980. Which of the integers is/are prime?

PROBLEM 7

A certain game uses unusual dice that have their six faces labeled 1, 2, 3, 5, 7, 9. If two of these dice are rolled and the numbers on the upper faces are added, what is the probability of rolling a sum of 10?

PROBLEM 8

Four congruent rectangles are arranged as shown to form a large rectangle. The area of the large rectangle is 768 cm^2 . What is the area of a square that has the same perimeter as the large rectangle?



PROBLEM 9

A neon billboard flashes a blue sign for Product A every 39 seconds, and it flashes a red sign for Product B every 20 seconds. If both signs flash at the same time at 8:00 pm, when is the next time they flash together?

PROBLEM 10

Find the measure of the angle z in the diagram, given that the two horizontal segments are parallel.

