

**WISCONSIN MIDDLE SCHOOL STATE MATHEMATICS MEET**  
**WISCONSIN MATHEMATICS COUNCIL**  
March 2 – 6, 2015

Problem Set #1

Score:

(For Scorer's Use Only)

Name: \_\_\_\_\_

Team: \_\_\_\_\_

[Reduce all common fractions. Decimal approximations are **not** accepted except when specifically asked for. When allowed, round decimal approximations to **3** decimal places. **No rounding should be done except on the final answer.**]

**For this first problem set, calculators are not allowed. They may be used for the remainder of the meet only, starting with Problem Set #2.**

Answers

1. (1 point)

In a math contest of 12 problems, 5 points were given for each correct answer and 3 points were deducted for each incorrect answer. If Deb answered all 12 problems and scored 20 points, how many correct answers did she have? \_\_\_\_\_

2. (3 points)

Mr. Halvorson owns his own business. This year, he wanted to have an average income of \$4000 per month. For the first 7 months of the year, his average monthly income was \$4600. What must his average income be for the next 4 months if he wishes to take a month's vacation in December without pay? \_\_\_\_\_

3. (5 points)

On segment  $\overline{AF}$ , we have  $AD = 33$  and  $BF = 62$ .  $\overline{CD}$  is three times as long as  $\overline{AB}$ ,  $\overline{BC}$  is half as long as  $\overline{DE}$ , and  $\overline{EF}$  is just as long as  $\overline{BD}$ . What is the length of  $\overline{EF}$ ? \_\_\_\_\_



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Problem Set #2

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Name: \_\_\_\_\_

Team: \_\_\_\_\_

[Reduce all common fractions. Decimal approximations are **not** accepted except when specifically asked for. When allowed, round decimal approximations to **3** decimal places. **No rounding should be done except on the final answer.**]

Answers

1. (1 point)

If the digits A, B, and C are added, the sum is the 2-digit number AB as shown below. What is the value of C?

\_\_\_\_\_

$$\begin{array}{r} A \\ B \\ + C \\ \hline AB \end{array}$$

2. (3 points)

The top of a rectangular box has area 120 square inches, the front has area 96 square inches, and the side has area 80 square inches. How tall is the box?

\_\_\_\_\_

3. (5 points)

A box of 10 bottles of Pepsi contains 2 bottles that have prize-winning caps. If the bottles are checked one at a time, what is the probability that the fourth bottle checked is the first winning bottle discovered?

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Problem Set #3

Score:

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Name: \_\_\_\_\_

Team: \_\_\_\_\_

[Reduce all common fractions. Decimal approximations are **not** accepted except when specifically asked for. When allowed, round decimal approximations to **3** decimal places. **No rounding should be done except on the final answer.**]

Answers

1. (1 point)

The product of three consecutive negative integers is equal to 255 times the middle integer. What is the value of the middle integer?

\_\_\_\_\_

2. (3 points)

If the length of the base of a triangle is increased by 20% and the length of the height is decreased by 10%, by what percent has the area of the triangle changed, and is it an increase or a decrease?

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3. (5 points)

Chris hiked into the woods at 4 mph and returned by the same route at 3 mph. If the round trip took 3.5 hours, how many miles into the woods did he hike?

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Problem Set #4

Score: \_\_\_\_\_  
(For Scorer's Use Only)

Name: \_\_\_\_\_

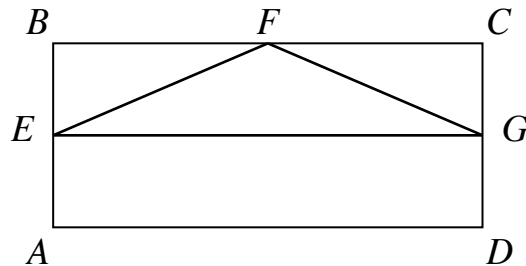
Team: \_\_\_\_\_

[Reduce all common fractions. Decimal approximations are **not** accepted except when specifically asked for. When allowed, round decimal approximations to **3** decimal places. **No rounding should be done except on the final answer.**]

Answers

1. (1 point)

$ABCD$  is a rectangle with area equal to 24 square units. Points  $E$ ,  $F$ , and  $G$  are midpoints of the sides on which they are located. What is the area of  $\triangle EFG$ ? \_\_\_\_\_



2. (3 points)

Six chefs require 20 minutes to prepare 30 desserts. At this rate, what is the minimum number of chefs needed to prepare 80 desserts in 15 minutes, assuming they all work at the same rate as each other? \_\_\_\_\_

3. (5 points)

The length of each leg of an isosceles triangle is  $x + 1$  and the length of the base is  $3x - 2$ . Determine all possible values of  $x$ . Note that your answer should be a range. \_\_\_\_\_

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Team Problem Set (Page 1)

Score: \_\_\_\_\_  
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Team: \_\_\_\_\_

Captain: \_\_\_\_\_

[Reduce all common fractions. Decimal approximations are **not** accepted except when specifically asked for. When allowed, round decimal approximations to **3** decimal places. **No rounding should be done except on the final answer.**]

Answers

1. (10 points)

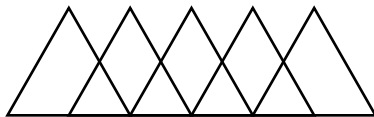
If today is January 1, 2015, what day will it be 2015 days from today?

\_\_\_\_\_

2. (10 points)

Five equilateral triangles, each with sides  $2\sqrt{3}$ , are arranged such that one side of each triangle lies along a line. Along this line, the midpoint of the base of one triangle is a vertex of the next. Determine the area of the region of the plane covered by the union of the five triangular regions.

\_\_\_\_\_



3. (10 points)

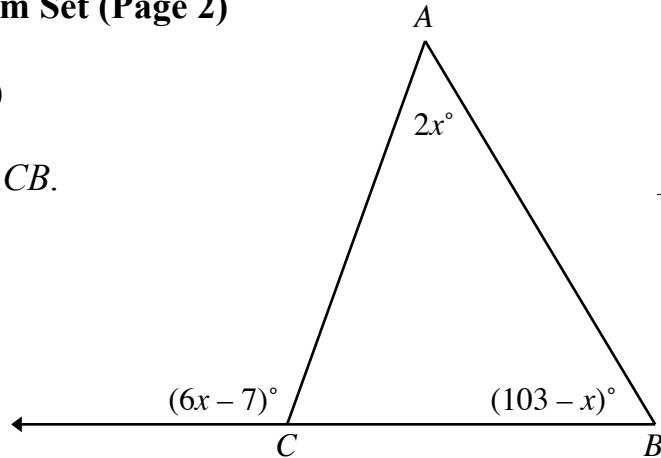
The mean, median, unique mode, and range of a collection of 12 integers are all equal to 12. What is the largest integer that could be in this collection?

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**Team Problem Set (Page 2)**

4. (10 points)

Find  $m\angle ACB$ .



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5. (10 points)

There are 15 men and 20 women at a party. If each woman shakes hands with everyone else once, and each man shakes hands with each woman once, how many handshakes will there be?

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6. (10 points)

Venn diagrams work well for two or three sets, but not as well for four or more sets. The noodle-shaped region shows one way that a fourth set might be included in a Venn diagram. If the natural numbers 1 through 72 inclusive are placed in the appropriate regions, what is the sum of the numbers in regions A, B, and C?

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