

WISCONSIN MIDDLE SCHOOL STATE MATHEMATICS MEET
WISCONSIN MATHEMATICS COUNCIL

March 5 – 9, 2018

Problem Set #1

Score:
(For Scorer's Use Only)

Name: _____

Team: _____

[Reduce all common fractions. Decimal approximations are **not** accepted unless 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)

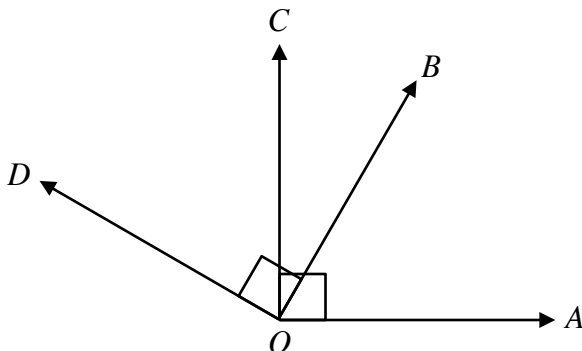
Josh weighs twice as much as his dog. If together they weigh 189 pounds, how much does Josh weigh? _____

2. (3 points)

Rectangular flashcards of size 3 inches by 4 inches are cut from a rectangular sheet of poster board measuring 2 feet by 3 feet. What is the greatest number of cards that can be cut from the sheet? _____

3. (5 points)

In the diagram below, $\overline{OA} \perp \overline{OC}$ and $\overline{OB} \perp \overline{OD}$.
If $m\angle AOD = 5(m\angle BOC)$, what is $m\angle AOD$? _____



WISCONSIN MIDDLE SCHOOL STATE MATHEMATICS MEET
WISCONSIN MATHEMATICS COUNCIL

March 5 – 9, 2018

Problem Set #2

Score:
(For Scorer's Use Only)

Name: _____

Team: _____

[Reduce all common fractions. Decimal approximations are **not** accepted unless 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)

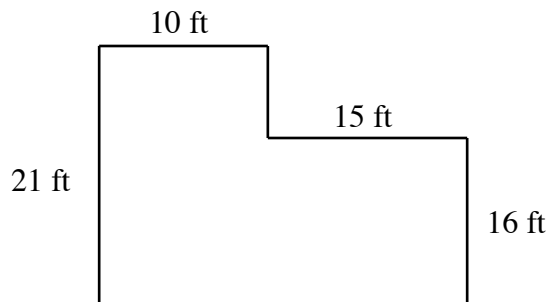
A number is randomly chosen from the integers 1 to 24 inclusive. What is the probability that the number is evenly divisible by either 5 or 6?

2. (3 points)

Bucky Badger's average for the first five bowling games was exactly 168. What must he bowl on his next game to have an average of 170?

3. (5 points)

A Wisconsin Dells conference center plans to renovate a room with the following shape:



High traffic carpeting costs $\$8.91/\text{yd}^2$. What is the cost to carpet the room with this high traffic carpet?

WISCONSIN MIDDLE SCHOOL STATE MATHEMATICS MEET
WISCONSIN MATHEMATICS COUNCIL

March 5 – 9, 2018

Problem Set #3

Score: _____
(For Scorer's Use Only)

Name: _____

Team: _____

[Reduce all common fractions. Decimal approximations are **not** accepted unless 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)

In the “magic square” shown to the right, five more numbers can be placed in the boxes such that the sum of the numbers in each row, column, and diagonal is always the same. What value should the x be?

15		35
50		
25	x	

2. (3 points)

Zip codes in the United States are five digits long, followed by a four-digit code, e.g., 53102-4078. In Wisconsin, every zip code begins with either 53 or 54. How many 9-digit zip codes are possible in Wisconsin, in which digits are used only once?

3. (5 points)

In a cheese curd eating contest, each contestant ate a whole number of cheese curds. The winner ate twice as many curds as the runner up, 3 times as many as the 3rd place contestant, and 4 times as many as the person in 4th place. Together, these four people ate fewer than 500 cheese curds. What is the greatest number of cheese curds the winner could have eaten?

WISCONSIN MIDDLE SCHOOL STATE MATHEMATICS MEET
WISCONSIN MATHEMATICS COUNCIL

March 5 – 9, 2018

Problem Set #4

Score:
(For Scorer's Use Only)

Name: _____

Team: _____

[Reduce all common fractions. Decimal approximations are **not** accepted unless 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)

A hockey league has 12 teams. Each season, every team plays every other team exactly once. How many games are played in one season?

2. (3 points)

What are the three ordered pairs of positive integers (c, d) that satisfy the equation $\sqrt{4^4} = c^d$?

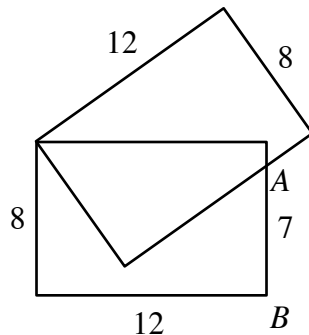
(____, ____)

(____, ____)

(____, ____)

3. (5 points)

Let two 8 by 12 rectangles share a common corner and overlap as in the diagram below, so that the distance AB from the bottom right corner of one rectangle to the intersection point A along the right edge of that rectangle is 7. What is the area of the region common to the two rectangles?



WISCONSIN MIDDLE SCHOOL STATE MATHEMATICS MEET
WISCONSIN MATHEMATICS COUNCIL

March 5 – 9, 2018

Team Problem Set (Page 1)

Score:
(For Scorer's Use Only)

Name: _____

Captain: _____

[Reduce all common fractions. Decimal approximations are **not** accepted unless 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)

The counting numbers are arranged in 4 columns as shown. Under which column letter will 2018 appear? _____

A	B	C	D
1	2	3	4
8	7	6	5
9	10	11	12
...	15	14	13

2. (10 points)

If a bug held onto a 16-inch diameter stationary exercise bike wheel 3 inches from the center of the wheel, how many miles would the bug have traveled when the bike has “traveled” 10 miles? _____

3. (10 points)

If 3 bushels are worth 5 baskets, and 7 buckets have the same value as 3 baskets, then how many buckets would you expect to get in fair trade for 36 bushels? _____

Team Problem Set (Page 2)

4. (10 points)

When 2^{2018} is multiplied by 5^{2019} , the product has 2019 digits. What is the sum of all of those digits? _____

5. (10 points)

In the addition example, different emojis represent different digits. What digit does ☺ represent? _____

$$\begin{array}{r} \text{☺} \quad \text{☺} \\ + \quad \text{☺} \quad \text{☺} \\ \hline \text{☹} \quad \text{☺} \quad \text{☹} \end{array}$$

6. (10 points)

Four overlapping rectangles create eight regions, as seen below. Place the digits 1 to 8, one digit per region, so that the sum of the numbers inside each rectangle is the same.

