

**WISCONSIN MIDDLE SCHOOL STATE MATHEMATICS MEET**  
**WISCONSIN MATHEMATICS COUNCIL**

March 1 – 5, 2021

Score:

Problem Set #1: One-variable Equations and Inequalities

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) For which value of  $x$  will the fractions

$$\frac{4+x}{5+x} \text{ and } \frac{8+x}{10+x} \text{ be equal?}$$

\_\_\_\_\_

2. (3 points) You have a pile of nickels, dimes, and quarters. There are twice as many dimes as nickels, and twice as many quarters as dimes. If the pile is worth \$7.50, how many nickels do you have?

\_\_\_\_\_

3. (5 points) How many possible values of positive integers  $n$  satisfy the following inequality:

\_\_\_\_\_

$$\frac{1}{2} < \frac{n}{n+1} < \frac{2019}{2021}$$

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Problem Set #2: Proportional Relationships

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) If 3 giggles equals 1 chuckle, and 5 chuckles equals 1 laugh, then how many laughs are equal to 315 giggles?

\_\_\_\_\_

2. (3 points) If it takes 4 pirates 12 hours to dig 8 holes, how long does it take 8 pirates to dig 32 holes?

\_\_\_\_\_

Assume that all holes are the same size and that all pirates are equally skilled at digging holes. Also assume that all pirates are equally lazy, which is why it takes so long for them to dig holes. Apologies to any pirates answering this question, but yes, you are a notoriously lazy lot.

3. (5 points) If a 24 inch by 28 inch by 66 inch aquarium holds 192 gallons of water, how many gallons of water will a 60 inch by 70 inch by 165 inch aquarium hold?

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Problem Set #3: Solving Real Life Problems Using Equations

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) The cost of an iPod and its protective case is \$229. If the iPod costs eleven dollars less than five times the cost of the case, what is the cost of the case?

\_\_\_\_\_

2. (3 points) Together, Derek and John weigh 121 lbs. John and Suzy weigh 113 lbs together. Suzy and Jillian together weigh 83 lbs. How many pounds do Derek and Jillian weigh together?

\_\_\_\_\_

3. (5 points) In the year 2000, 27 members of the Baseball Writers Association voted for the Cy Young award. Each voter selected a first, second, and third choice. The given table shows the number of votes and the total points awarded to the top candidates. How many points are awarded for a first-, second-, and third-place vote?

1<sup>st</sup> = \_\_\_\_\_ points

2<sup>nd</sup> = \_\_\_\_\_ points

3<sup>rd</sup> = \_\_\_\_\_ points

<u>Player</u>	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Total points</u>
Martinez	18	6	3	129
Hudson	6	12	9	81
Wells	3	9	15	60

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Problem Set #4: Congruence and Similarity

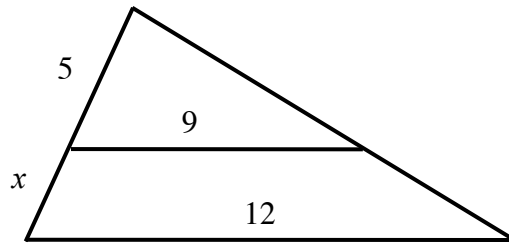
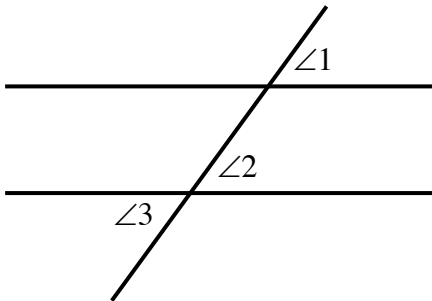
Name: \_\_\_\_\_

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.**]

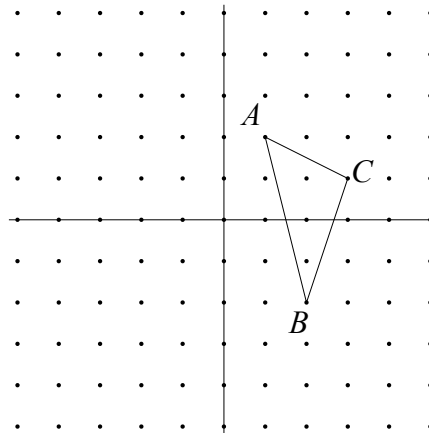
Answers

1. (1 point) In the figure below to the left, the two horizontal lines are parallel to each other. If  $m\angle 1 = 3x + 41$  and  $m\angle 2 = 8x + 6$ , determine  $m\angle 3$ .



2. (3 points) In the figure above to the right, the two horizontal lines are parallel to each other. Solve for  $x$ .

3. (5 points) Take  $\triangle ABC$  and reflect it over the line  $y = x - 1$ , then translate it up 3 units, and then reflect it over the line  $x + y = 1$ . What are the new coordinates of  $\triangle A'B'C'$ ?



$A' = (\underline{\quad}, \underline{\quad})$

$B' = (\underline{\quad}, \underline{\quad})$

$C' = (\underline{\quad}, \underline{\quad})$

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Score:

Problem Set #5: Understand and Apply the Pythagorean Theorem

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

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. (1 point) On a map, Wisconsin Rapids is 50 miles north of Sheboygan and 120 miles west of Sheboygan. How many miles is it from Wisconsin Rapids to Sheboygan as the crow flies (along a straight path)?

\_\_\_\_\_

2. (3 points) I am building a wooden shed. When I build the floor, I need to make sure it is a perfect rectangle. To do that, both diagonals of the rectangle must be congruent to each other. Given that the base of the shed is to be 8 ft by 12 ft, how long should those diagonals be? Give your answer in feet and inches, rounded to the nearest inch.

\_\_\_\_\_

3. (5 points) Two cars leave from the same street intersection at the same time. One car travels north, the other car travels east. When the two cars are 29 miles apart, the northbound car has traveled one mile farther than the eastbound car. How many miles did the northbound car travel?

\_\_\_\_\_