

Orange County Middle School Mathematics Contest 2008  
Problem Solving Round

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*Counting Cookies*

There was a jar of cookies on the table. Lily was hungry because she hadn't had breakfast, so she ate half the cookies.

Then Douglas came along and noticed the cookies. He thought they looked good, so he ate a third of what was left in the jar.

Ethel came by and decided to take a fourth of the remaining cookies with her to her next class.

Then Douglas came dashing up and took another cookie for later.

When Lily looked at the cookie jar, she was surprised to see that there were only two cookies left.

How many cookies were there in the jar to begin with?

Place the answer on your TEAM ANSWER SHEET.

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*Sum of the Digits*

What is the sum of all the digits in this sequence?

1, 2, 3, 4, 5, 6, 7, ... 99, 100

HINT: (Sum of the *digits*, not the *numbers*!)

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*How much ribbon?*

A birthday gift is tied with ribbon as shown. The bow requires 47cm of ribbon. What is the total length of the ribbon in meters?



Place the answer on your **TEAM ANSWER SHEET**.

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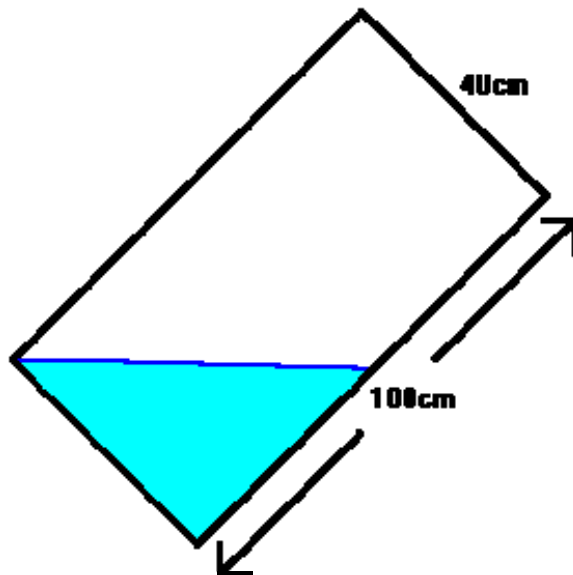
*How much water?*

George and Phil were playing with their fish tank again. They had a difficult time keeping their fish alive.

The fish tank is 100cm long, 60 cm wide and 40 cm high.

They tilted the tank, as shown, resting on a 60 cm edge, with the water level reaching the midpoint of the base.

When they rest the tank down to a horizontal position, what is the depth of the water in cm?



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*Guess this number!*

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Tell what number is described below.

- The number is not an odd number.
- It has exactly four factors.
- If you reverse the digits, a prime number is formed.
- The sum of the digits is a two digit prime number.
- The number is less than the square root of  $10^4$ .
- One of the digits is a square number.

Place the answer on your TEAM ANSWER SHEET.

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*Rainy Days*

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If there is a 50% chance of rain on Saturday and a 25% chance of rain on Sunday, what is the chance it will rain both days if both events are independent?

Express your answer as a percent.

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*Counting Windows*

There are two floors plus the attic in Mr. Smore's house. Mr. Smore is fixing all of the windows. He discovered that the windows don't all have the same number of glass window panes.

- Each second-floor window has 9 panes on top and 6 on the bottom.
- There are two more windows on the first floor than on the second.
- Each downstairs window has 8 panes of glass on top and 8 on the bottom.
- The attic has one window with 4 panes of glass.
- Each of the 10 rooms of the house has at least one window.

Mr. Smore has counted 315 panes of glass in all.

Each window needs one new lock. How many locks will Mr. Smore need for each window to have a new lock?

Place the answer on your TEAM ANSWER SHEET.

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*Shaking Hands*

You are in a roomful of 35 people. Everyone is asked to shake hands with everyone. How many handshakes will there be if everyone shakes hands with everyone once?

Place the answer on your TEAM ANSWER SHEET.

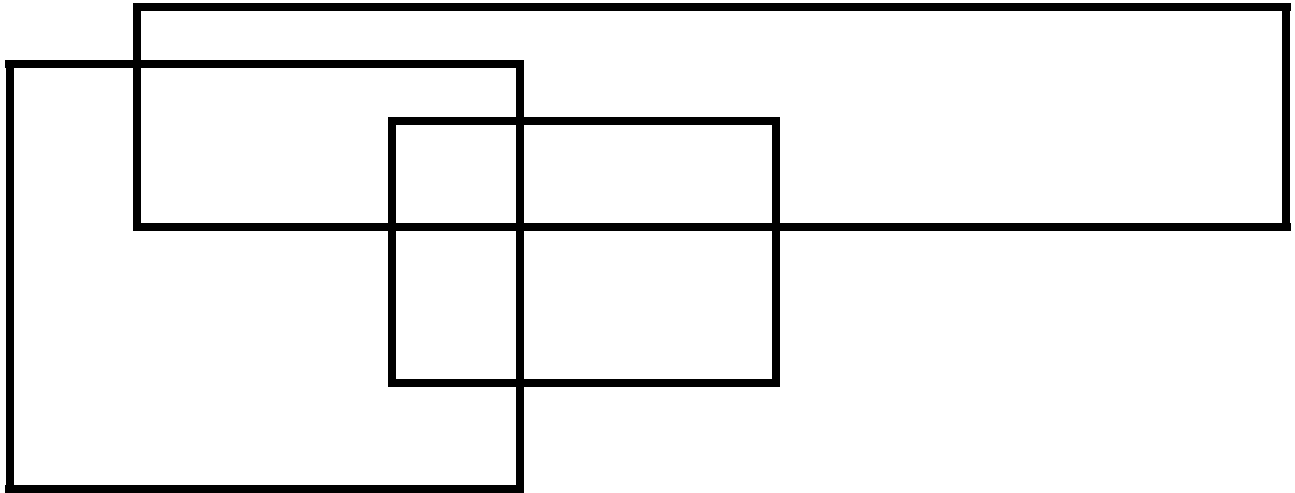
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*Counting Rectangles*

How many rectangles are in this figure?



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*Working at the Local Kennel*

George, Archie, Fran, and Megan work for the summer at the local kennel.

- George gives the dogs baths every 4 days.
- Archie cleans out cages every 6 days.
- Fran feeds the animals in Section B every 2 days.
- Megan helps the receptionist every 3 days.

How many times in 12 weeks will all 4 helpers be at the clinic on the same day?

Place the answer on your TEAM ANSWER SHEET.

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*Typing a Report*

Sally can type a certain report in 20 minutes hours.

Jeff can do it in 30 minutes.

How long will it take for the two of them to do it together?

Place the answer on your TEAM ANSWER SHEET.

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*Chirping Crickets*

Biologists have found that the number of chirps some crickets make per minute is related to the temperature. The relationship is very close to being linear (lets assume that for this problem).

When crickets chirp 124 times a minute, it is about 68 degrees Fahrenheit.

When they chirp 172 times per minute, it is about 80 degrees.

About how warm is it if you hear 100 chirps per minute?

Place the answer on your TEAM ANSWER SHEET.

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Orange County Middle School Mathematics Contest 2008  
Problem Solving Round – Answers

*Counting Cookies*

There are **12** cookies.

*Sum of the Digits*

The sum is **901**.

*How much ribbon?*

There are **177** cm of ribbon

*How much water?*

The water is **10** cm deep.

*Guess this number!*

The number is **74**.

*Rainy Days*

The probability of rain both days is  $\frac{1}{8}$  or **0.125 or 12.5%**.

*Locks on Windows*

He will need **21** locks.

*Shaking Hands*

There will be **595** handshakes.

*Counting Rectangles*

There are **12** rectangles.

*Working at the Kennel*

They will be together **7** times.

*Typing a Report*

It will take them **12** minutes.

*Chirping Crickets*

It is about **62** degrees.