Triangle Teasers: Solution

The numbers in the middle of the three triangles are 3, 3, and 10 respectively. To determine the number in the middle of each triangle, add the two bottom numbers, then subtract the top number.
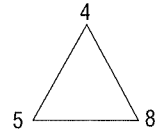
What if
we also added other sides and took the opposite corner number away?

for example:
$$5 + 8 - 4 = 9$$
$$4 + 5 - 8 = 1$$
$$4 + 8 - 5 = 7$$

These answers are all odd. Will this always be the case? Look for some rules.
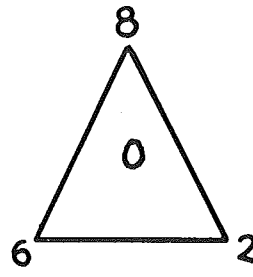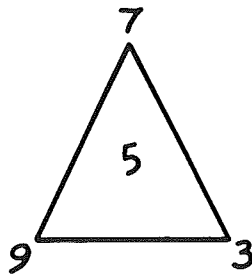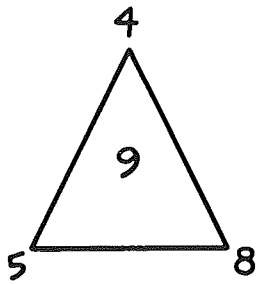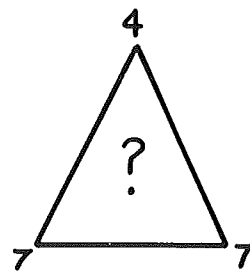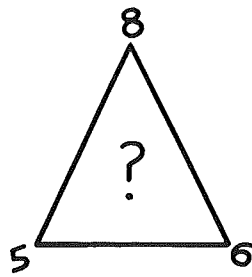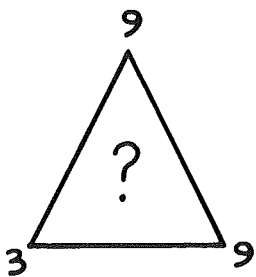

Year 5

Maths Challenge

1

Name _____ Date _____

Triangle Teasers

The triangles below follow a certain rule to determine the number that is in the middle.

What numbers go in these three triangles?

Pick a Picket Fence: Solution

The length of the fence is $3\frac{1}{2}$ metres, which is 350 cm. 24, 5 cm pickets will take up 120 cm. There are 230 cm for the spaces between the pickets (300 − 95). Since there are 24 pickets, there will be 23 spaces. The space between the pickets will be 10 cm (230 ÷ 23).

What if
the gaps between the pickets were 9 cm? How long would the fence be if the gap was ... 8 cm? 7 cm?

How much does the length change each time?

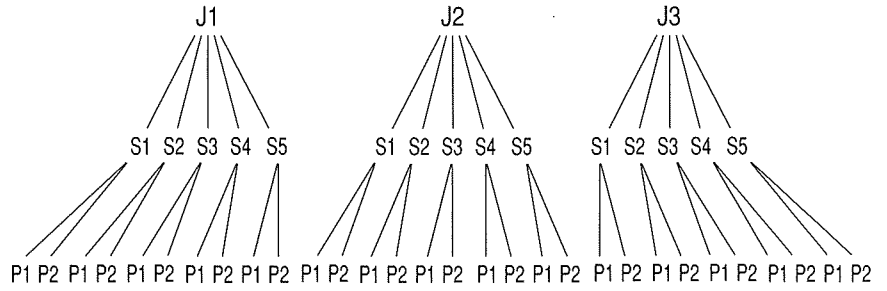
Name _____ Date _____

Pick a Picket Fence

Francis is building a fence, which will be $3\frac{1}{2}$ metres long. He has already built the frame, and he is now ready to attach the pointed pickets. He wants to place the pickets so that they are evenly spaced, using a picket at each end. He has 24 pickets, which are each 5 cm wide.

How much space does he need to put between each picket?

Mix 'n Match: Solution

The older sister is correct. There are 30 different ways to mix and match the jeans, shirts, and pairs of shoes. One pair of jeans goes with 5 shirts, so there are 15 ($3 \times 5 = 15$) jeans-and-shirt combinations. Each of these combinations can be worn with either of two pairs of shoes, which makes 30 ($15 \times 2 = 30$) different outfits.

Here is a tree diagram that shows the answer.

```
      J1                    J2                    J3
   //|\\                 //|\\                 //|\\
  / / | \ \             / / | \ \             / / | \ \
S1 S2 S3 S4 S5      S1 S2 S3 S4 S5      S1 S2 S3 S4 S5
```

P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2 P1 P2

Name _____ Date _____

Mix 'n Match

The older sister bragged that she has 30 different new outfits to wear to school.

The younger brother said, "That's not true. You've got 3 pairs of jeans, 5 shirts, and 2 pairs of shoes. There's no way that makes 30 different outfits. You only have 10 outfits."

Who is correct and why?

Pizza Party: **Solution**

You can choose from 32 different pizzas. There are 1 plain, 5 with one topping, 10 with two toppings, 10 with three toppings, 5 with four toppings, and 1 with five toppings.

What if
there were different numbers of toppings?

Try for 0 toppings, 1, 2, 3, 4, 5, 6 .... Write your answers below one another, with all the combinations, such as for this first problem, write: 1, 5, 10, 10, 5, 1 = 32.

What do you notice about your answers and the totals?

Year 5 **Maths Challenge** *14*

Name _____ Date _____

Pizza Party

Roma Pizzeria offers these pizza toppings for their standard large pizza:

    mushrooms   olives

    peppers   garlic

    onions

In addition to ordering a plain pizza, you can order any number of toppings. Their "special" uses all five toppings!

How many different kinds of pizza can you choose?

Year 5   **Maths Challenge**   17

Name _____ Date _____

Weather Wizards

Temperatures and Weather Conditions

City	Conditions	°C
Preston	Partly Cloudy	6
Lerwick, Shetland	Partly Cloudy	−5
St. Helier, Jersey	Sunny	12
London	Partly Cloudy	7
Inverness	Snowy	0
Portsmouth	Rainy	9
Cardiff	Partly Cloudy	4

Children in the Weather Wizards Club are keeping track of the weather in their local area. The temperatures and weather conditions they posted are listed above. The weather wizards are Ashley, Danny, John, Joseph, Lilly, Sasha, and Tiffany. They each report from a different area.

- Lilly and Joseph reported partly cloudy skies and temperatures below 7°C.

- Danny reported the coldest temperature, and Ashley reported the warmest.

- The temperature in Tiffany's city is 1 degree warmer than in Lilly's.

- John is planning to make a snowman.

Who is in each town?

What if
Jane joins them? Jane's best stroke is the crawl.

Re-write the puzzle to include Jane.

Maths Challenge

Name _____ Date _____

In the Swim

Elena, Pam, Anna, and Lori are in a swimming team. Each of them swims a different event: backstroke, butterfly, breaststroke, and freestyle.

Pam never swims the backstroke, and Elena's best friend swims freestyle. During a swimming competition, Anna and Lori cheered as their team member broke the record for the 50-metre breaststroke. They watched another team member swim the backstroke and win. Then Pam watched Lori swim the 100-metre freestyle.

Match the swimmer with her event.

Year 5   # Maths Challenge   *21*

Name _____ Date _____

Climbers' Concern

Each of a party of eight mountain climbers had enough food for 15 more days when
they came upon two more climbers in need of help. It seems that the two climbers lost
their food when their rope broke. So they joined the party of eight and continued on.

The climbers decide that each of them will use the same amount of food each day as
they originally planned. However, they will have to cut their trip short because the food
will run out sooner.

For how many more days do the climbers have food?

Curtis sent the card with a basketball player.

Gordon sent the card with dogs.

Salim's card was handmade.

Sam sent the card with space aliens.

Tim's card had the cartoons.

Name _____ Date _____

Valentine Mystery

Hannah and her classmates all exchanged valentine cards. Most of the ones Hannah received were signed, but five of them were marked "Guess Who?" Now she's trying to work out who sent which one. One of them was decorated and hand-made. Of those purchased, one pictured space aliens, another had a basketball player, and the third featured dogs. The last one pictured cartoon characters from a TV series. Hannah narrowed down the possible givers to Curtis, Gordon, Salim, Sam, and Tim.

Help her use these clues to decide who sent which valentine card.

- Sam, Curtis, and Gordon are all sports fans.

- Salim is very artistic and enjoys doing crafts and paintings.

- Gordon has four dogs.

- Sam frequently mentions that he dislikes cartoons but reads science fiction and space stories.

Year 5   # Maths Challenge   28

Name _____ Date _____

Costume Party

Fiona, George, Rachel, and Patrick are planning their costumes for a party. Each will wear a different costume. There will be a pirate, a ghost, a Martian, and a gorilla.
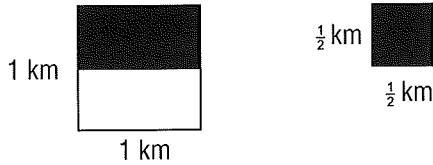
- No one will have a costume that begins with the same letter as the name of the person wearing it.

- The Martian is a boy.

- The gorilla is a girl.

- Patrick likes science fiction and space characters.

- Fiona didn't want to be a ghost this year.

Which costume will each person wear?

The first son fenced in an area that is twice as large as the one fenced in by the second son.

What if
the lengths of the sides of a rectangle are doubled? Is the area also doubled? Try it out on squared paper and see.

half a square kilometre   a half kilometre square

1 km

1 km

$\frac{1}{2}$ km

$\frac{1}{2}$ km

Year 5

Maths Challenge

32

Name _____ Date _____

Fenced In

A farmer had two sons. He asked each son to fence in a section of land. To the first son he said, "Go and fence in the land over there that is half a square kilometre." To the second son he said, "Go and build a fence around the land over there that is a half a kilometre square." Each son did exactly as he had been told, but the farmer couldn't believe that the sons had different results.

Which son fenced in the larger area?