301 MATHEMATICAL ENIGMAS (a sample)

by Marie Berrondo-Agrell
Translated by Roberta Faulhaber

Start with the easy ones

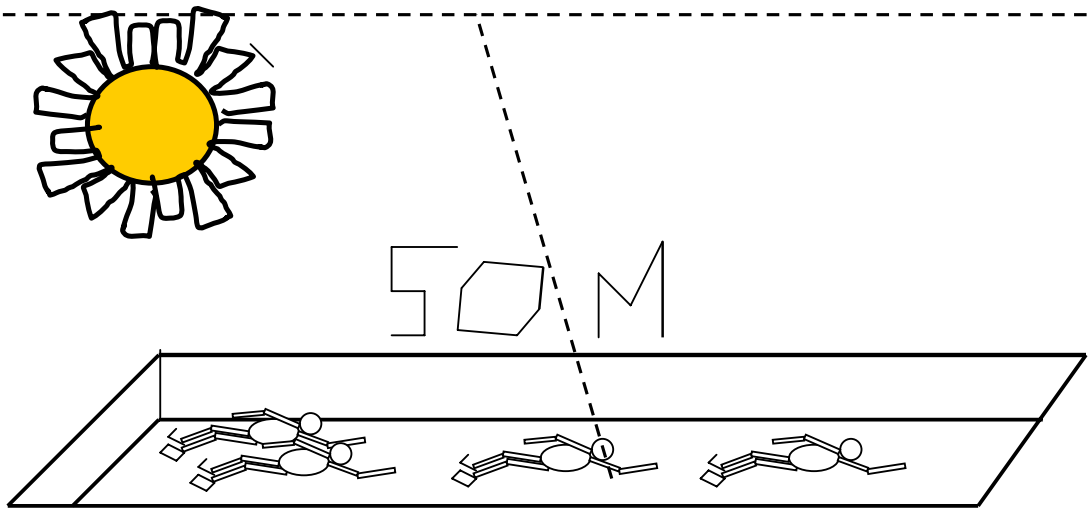
ALICE IN CANDYLAND

"It's Carnival time! I'm going to use my pocket money to buy some goodies at the candy store. If I buy one, I'll have 85 cents left. But to buy 4, I'm missing 2 dollars and 15 cents. Because one piece of candy costs $..."

Upside-down hint:
How much do three candies cost?

BETTY, SALLY, YOU, AND ME

"We're having a race, doing the crawl the length of the Olympic pool. I took off 7 seconds after you, one second before Sally and 4 after Betty. If you arrive 2 seconds later than I do, 5 after Betty, and 7 before Sally, the worst swimmer of us all is …."



Upside-down hint:
How many seconds more did you need than I did?

RUTABAGA, AND TURNIP SAUCE
You are supposed to choose one of these four main dishes at the cafeteria today:

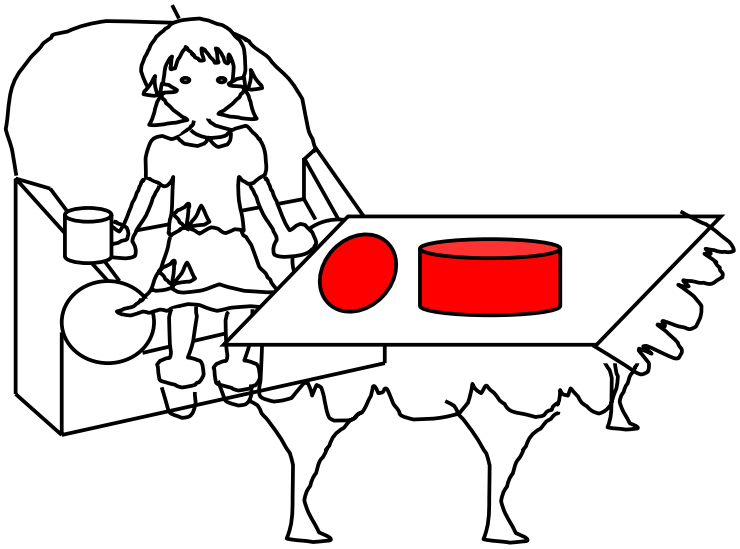
If 68% of diners do not choose fish with boiled potatoes, and 76% do not choose hamburger and fries, and 57% do not choose Indian chicken, what is the probability that the person right behind you in the line chooses cold beef tongue with rutabagas and turnip sauce, yum?

Upside-down hint:

What do the reverse percentages represent?

FROM MIDNIGHT TO MIDNIGHT

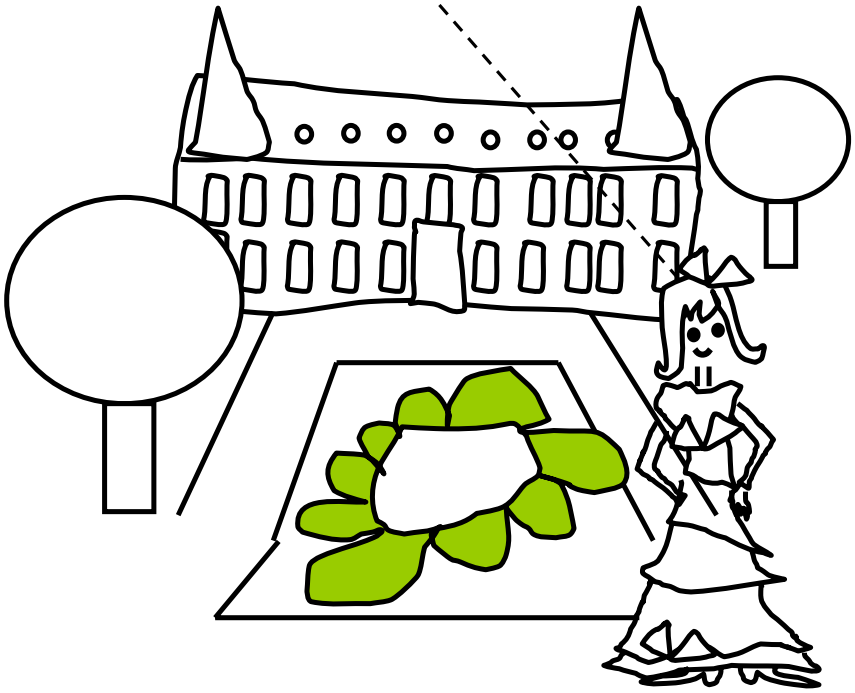
If you add to two-fifths of the time that has passed since midnight to three-elevenths of the time you still have before midnight, you will find out the time it was yesterday at the same time. Am I eating my breakfast, my lunch, my tea, or my dinner?



Upside-down hint:
X is the exact time. We have…

WATERLILY INVASION

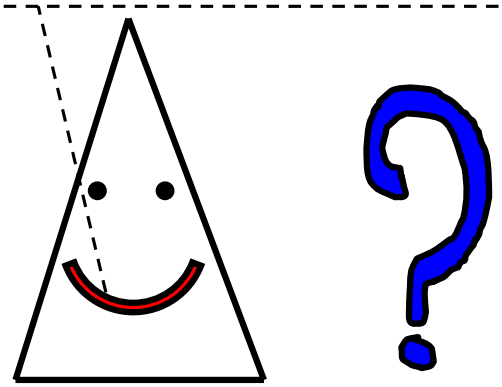
In the little pond of my big castle, the lovely water lilies double the area of water they cover every day. After 44 days, my little pond seems all white. Can you guess how many days it took the water lilies to cover a quarter of the pond?



Upside-down hint:
How much area do the waterlilies cover in a couple of days?

MYSTERY TRIANGLE

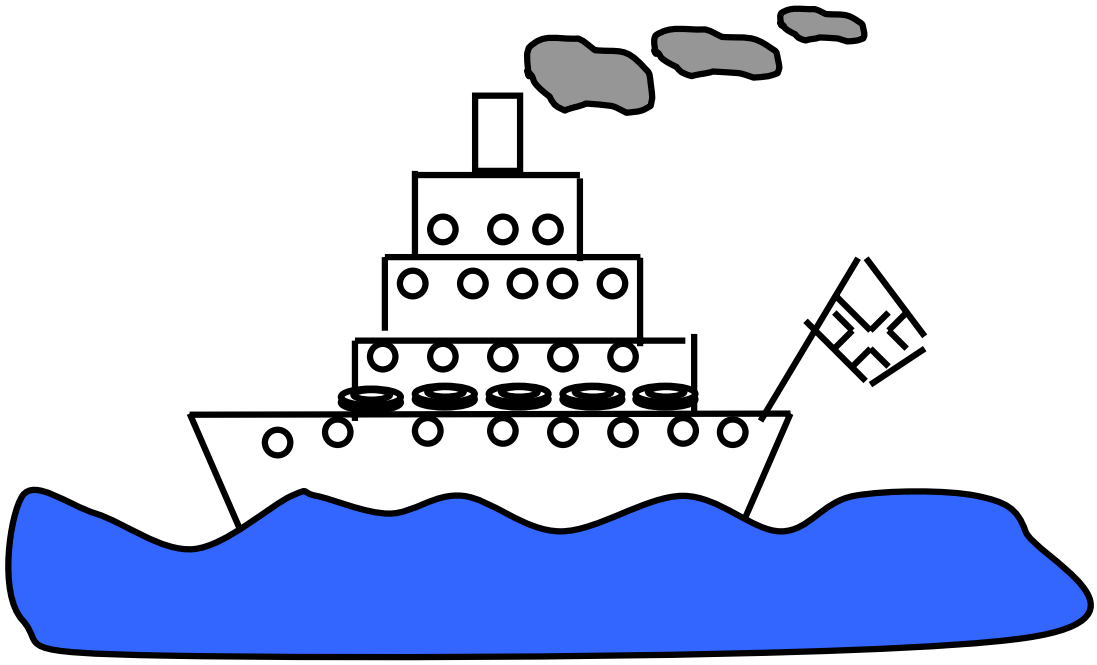
I'm an isoceles triangle called ABC. My A angle is 54°, my B angle is neither 54° nor 72°. What is my C angle?



Upside-down hint:
Angle A can be either one of the two equal angles of the triangle or the angle at the tip. .

FROM WAXHOLM TO STOCKHOLM

You're driving the boat that connects Waxholm to Stockholm. The time is 2.47 pm. One ticket costs 58 Swedish crowns. The temperature is 19°. There were 83 passengers at the start, with 16 children under 12 who don't have to pay for a ticket, and 13 people over 65 who pay half fare. Five passengers have embarked since Lidingö Island and 12 passengers disembarked onto Nacka Island. 37 passengers bought a coffee for 17 Swedish crowns during the crossing. 22 also ate a small almond cookie called a "Mazarin" for 21 crowns, and 5 even had a big piece of green cake called a "Prinsess tårta" for 32 crowns. In conclusion, how old is the captain?

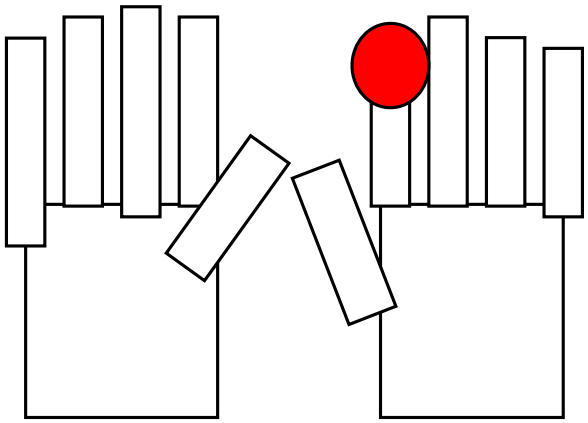


Upside-down hint:

Read the text carefully from the beginning.

9's MULTIPLICATION TABLE FOR IDIOTS

If you have trouble remembering the 9 multiplication table, place your two hands on the table, with fingers slightly apart.
For example, you want to know the product of 9 x7. Just bend the 7th finger from the left and count the fingers still on the table to the left, 6, and to the right of the bent finger, 3. The result is thus 9 x 7 = 63.



You can do the same thing for any number, it will always work!

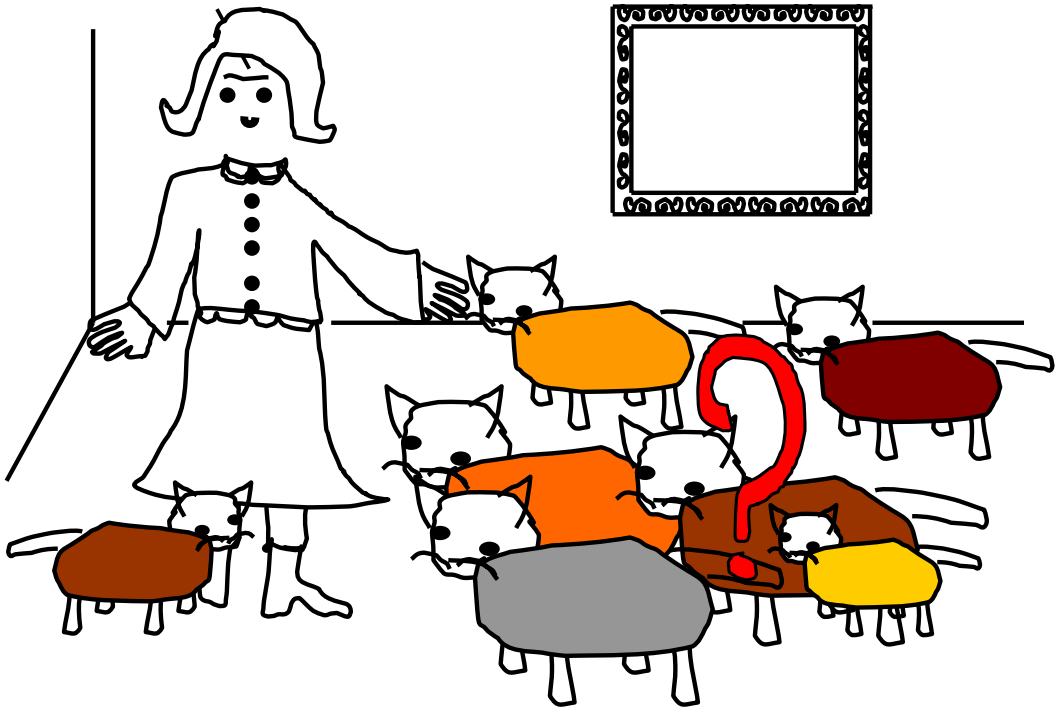
It's up to you to explain this very clever solution…

Upside-down hint:
How many fingers remain to the left if you bend the n^{th} finger, and how many remain on the right?

LEONIE'S CATS

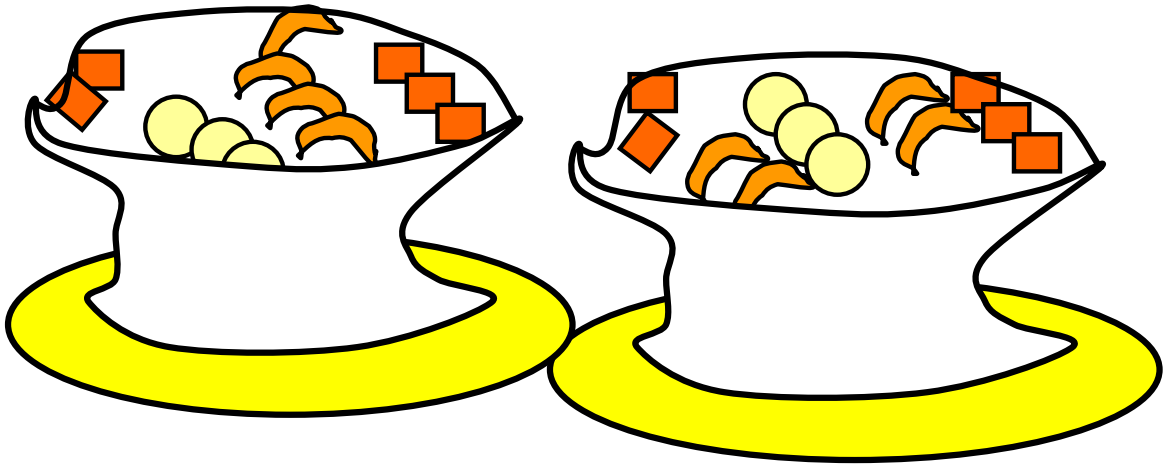
My name is Leonie, and if you ask me how many cats are sharing my life, I will reply that I live with three-quarters of my cats plus 3 quarters of one cat. Can you guess how many cats are crowded into my small apartment?

Upside-down hint:
X is the number of cats.



MINI-PASTRIES

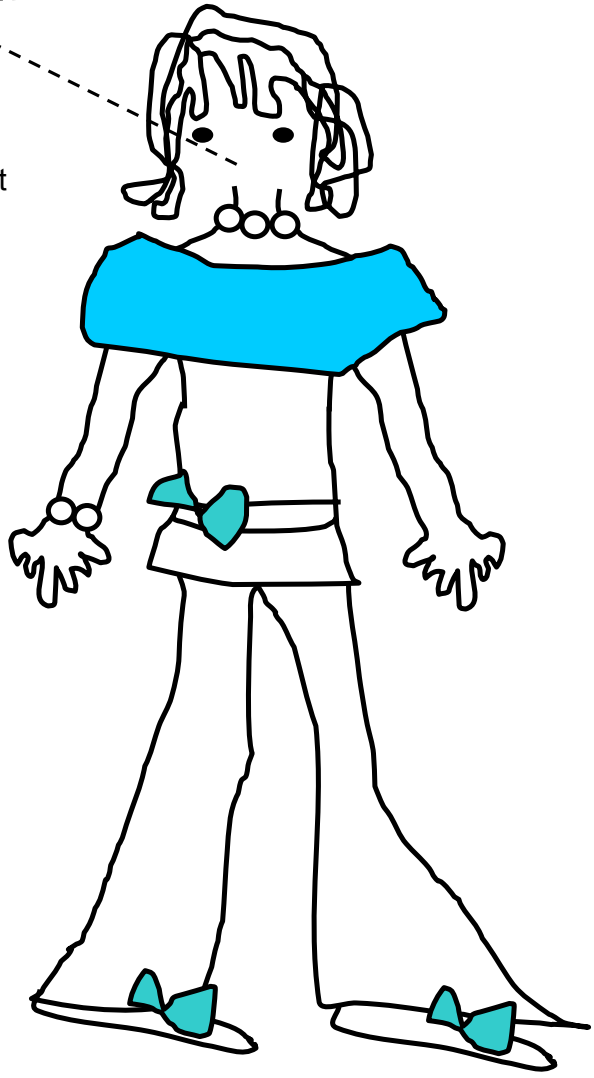
Here are 2 small baskets. Each one contains 3 mini-raisin pastries, 4 mini-croissants, and 5 mini chocolate pastries.
You take enough mini-pastries from the first basket without looking, enough to be sure that you can eat 3 identical pastries.
You take enough pastries from the second basket to be sure to eat one mini-pastry of each type.
Which basket then contains the most mini-pastries?



Upside-down hint:
Consider the unluckiest situation depending on your goal.

WHERE ON EARTH IS MY CELLPHONE?

Since this morning, I have been looking for my keys, my diary, and my cellphone whose battery is dead. I have only been in my room, the kitchen, and the shower, and I believe I left one object in each place. But I never take the keys into the bedroom, or the cellphone into the shower. So if the keys are not in the shower, where is my cellphone?

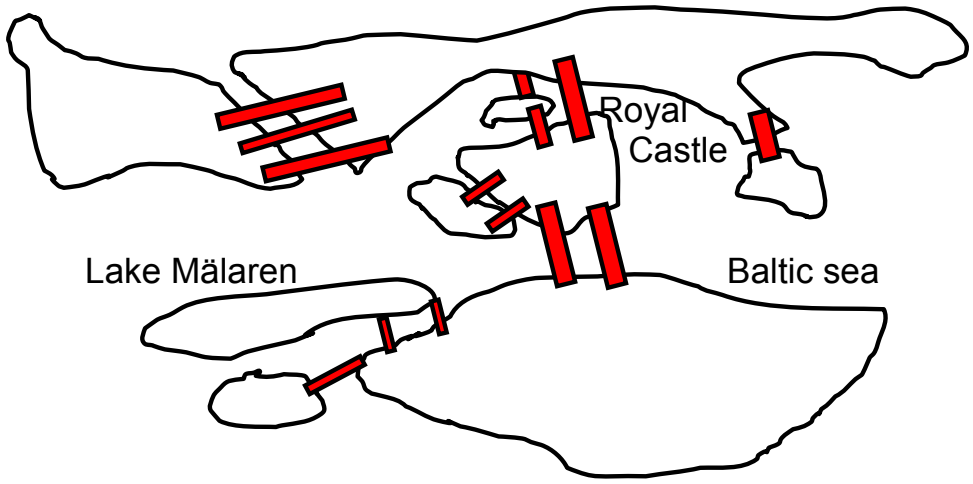


Upside-down hint:
Draw a table with 3 rows and 3 columns, fill it out with 1's and 0's depending on whether it is possible or not.
.

	diary	keys	cellphone
kitchen			
room			
shower			

MAP OF STOCKHOLM

Here is a simplified map of Stockholm and its 13 bridges:



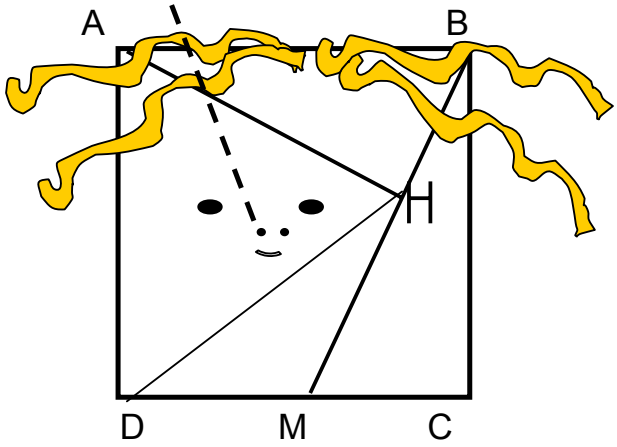
Do you think it's easier to go by foot once and only once on each bridge, or go by boat once and only once under each bridge?

Upside-down hint:
What is the parity of the number of bridges linked to each land area?

A few somewhat difficult enigmas

ABCDMH

Hi! I'm ABCD, a square with 4 cm sides. M is in the middle of CD. H is the foot of the perpindicular drawn from A to BM. Can you guess how long DH is?

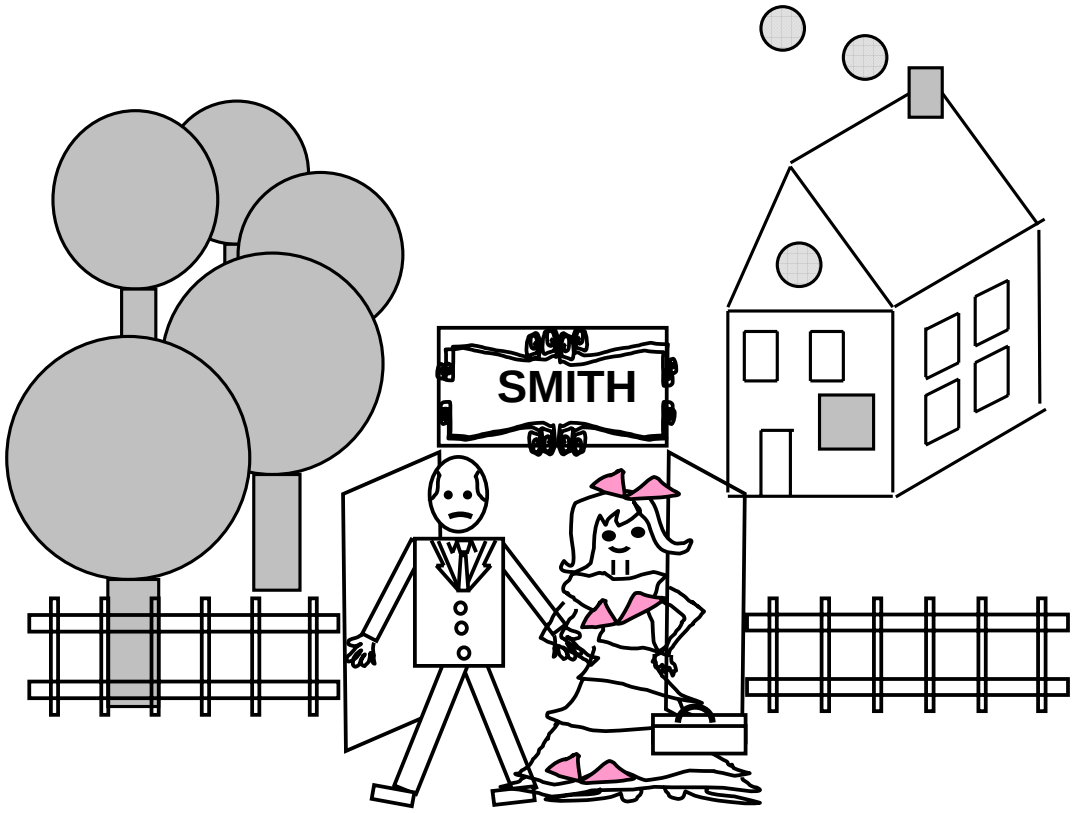


Upside down hint:
Draw a DCEF square next to the other square.

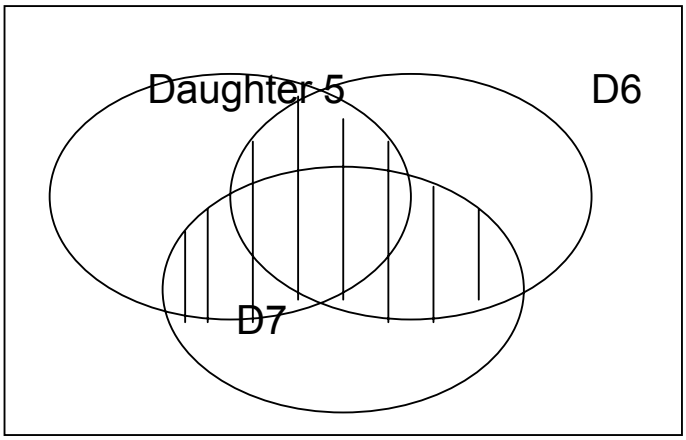
A BRITISH FAMILY

Mr. and Mrs. Smith live in a pretty cottage with their 3 children, 5, 6 and 7 years old.

At least two of them are girls. What is the probability that the eldest is a boy?

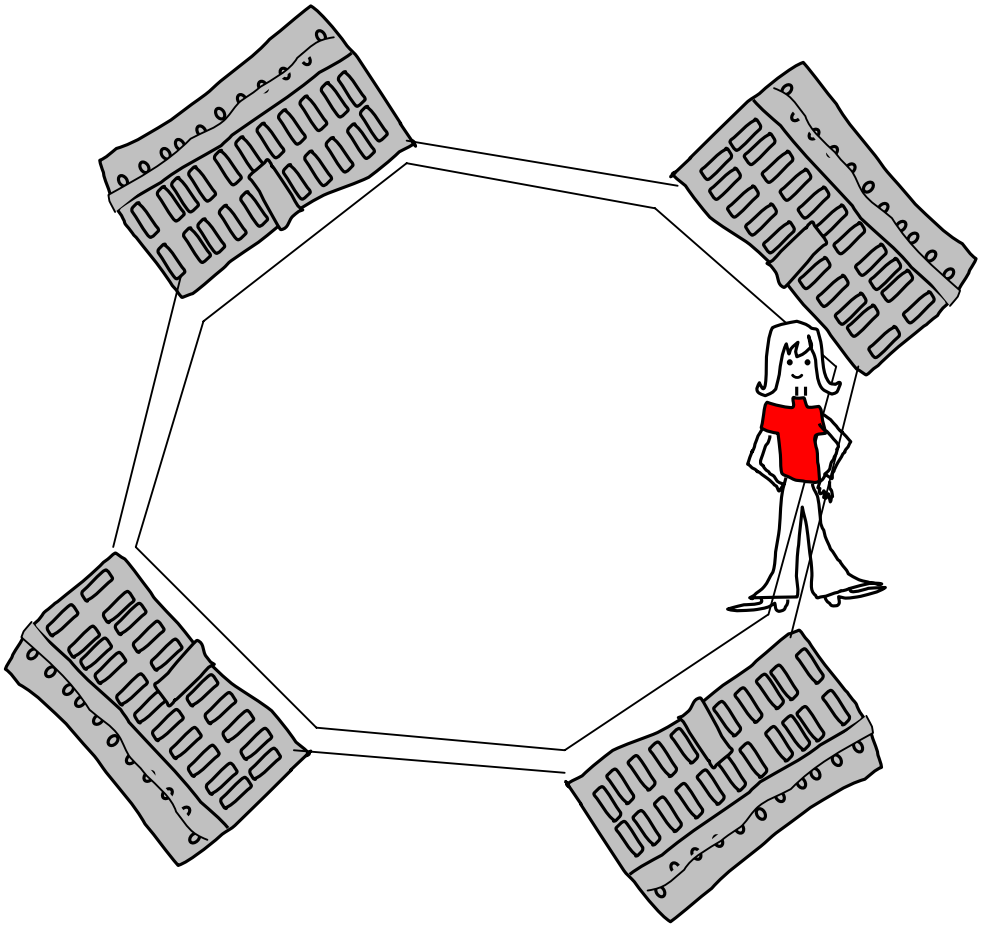


Upside down visual hint:

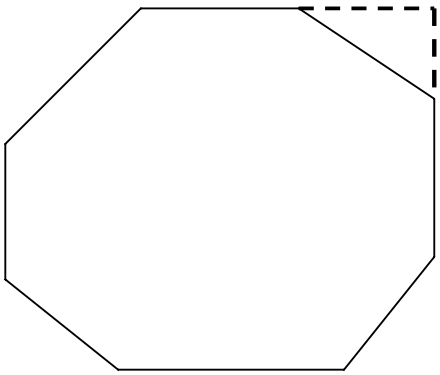


AMALIENBORG

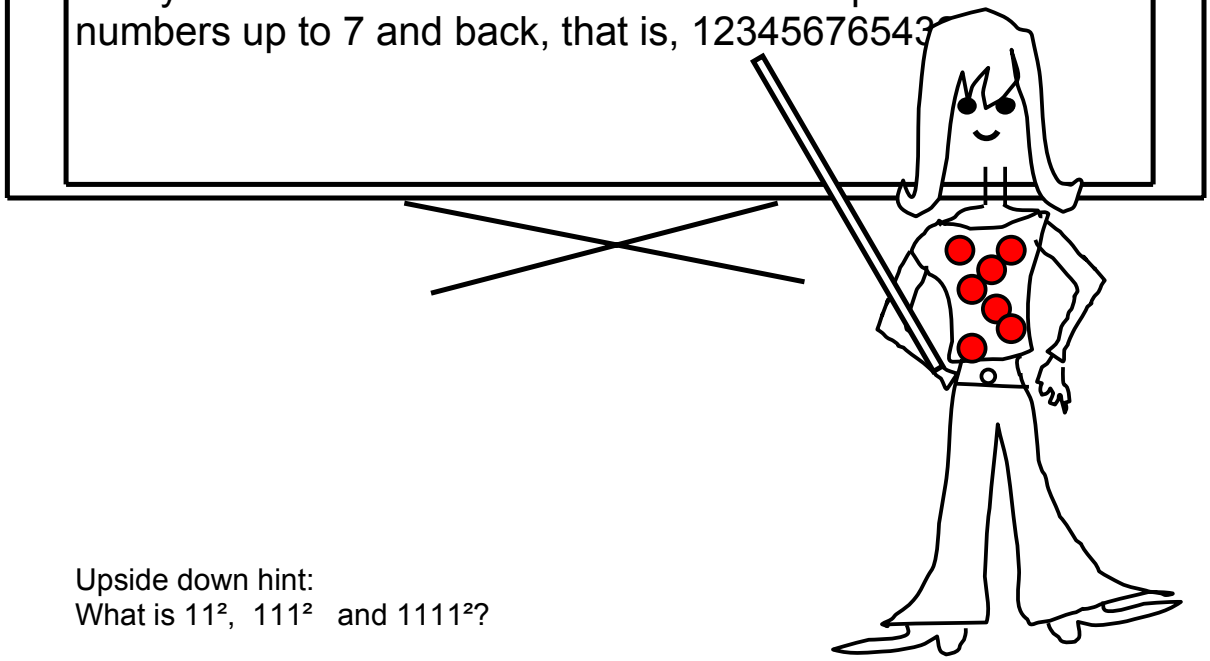
Amalienborg is a charming square in Copenhagen with 8 equal sides and 8 equal angles for a total area of 3000 m². Take a walk around the square. What distance have you covered?



Visual hint:



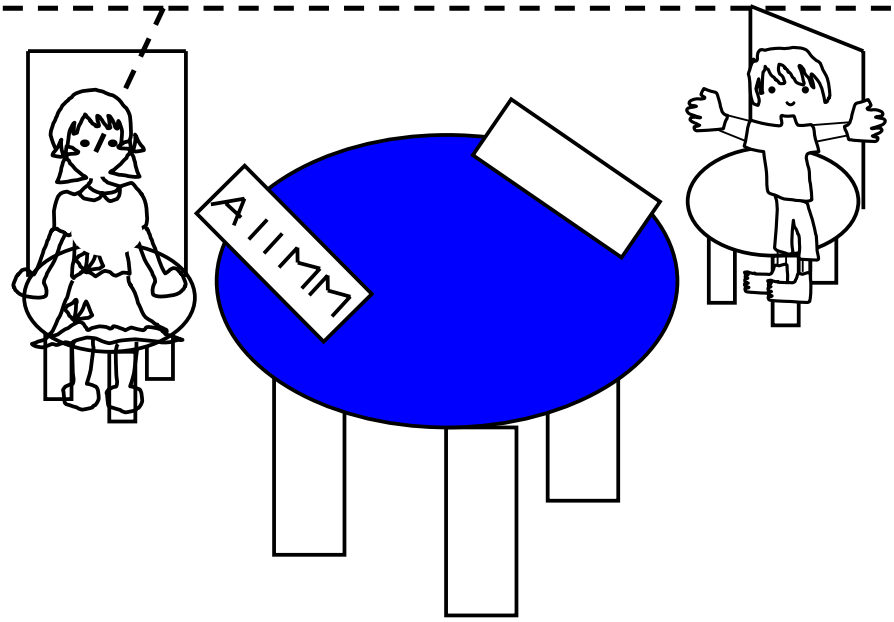
ROUNDTRIP TO 7



Upside down hint:
What is 11^2, 111^2 and 1111^2?

AMERICAN STORY

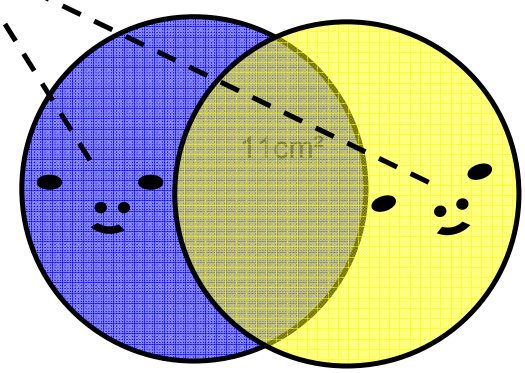
I love to play Scrabble. I have one A, 2 I's and 2 M's all in a line on my stand. Is there more or less than 1 chance out of 10 to have involuntarily written the name of a big American city?



Upside-down hint:
For 5 different letters, we have 5 x 4 x 3 x 2 = 120 different possibilities.

BLUE + YELLOW = GREEN

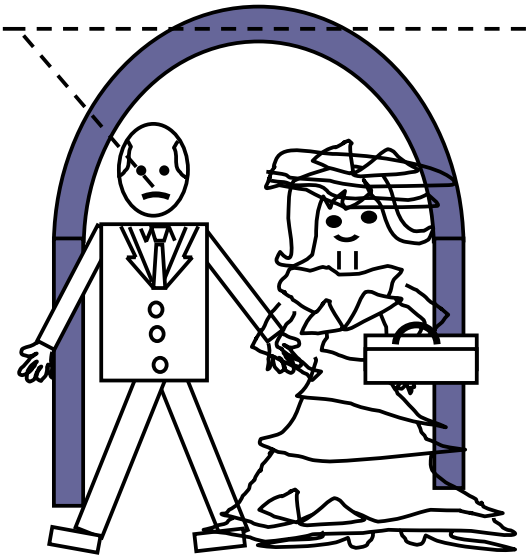
We are 2 equal circles. Each of our centers is situated on the other one. If you color one of us in blue and the other in yellow with water colours, the green area measures 11 cm². Can you guess the length of our common radius?-



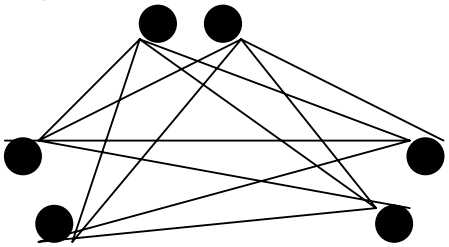
Upside-down hint:
The green area is made up of a central diamond and 4 small equal areas.

GOOD EVENING, LADIES AND GENTLEMEN

The reception is over. Everyone leaves in pairs. 24 handshakes are exchanged. How many people were at the reception?



Upside down hint:
Each handshake involves two different hands.
So try to draw what happens with three couples.

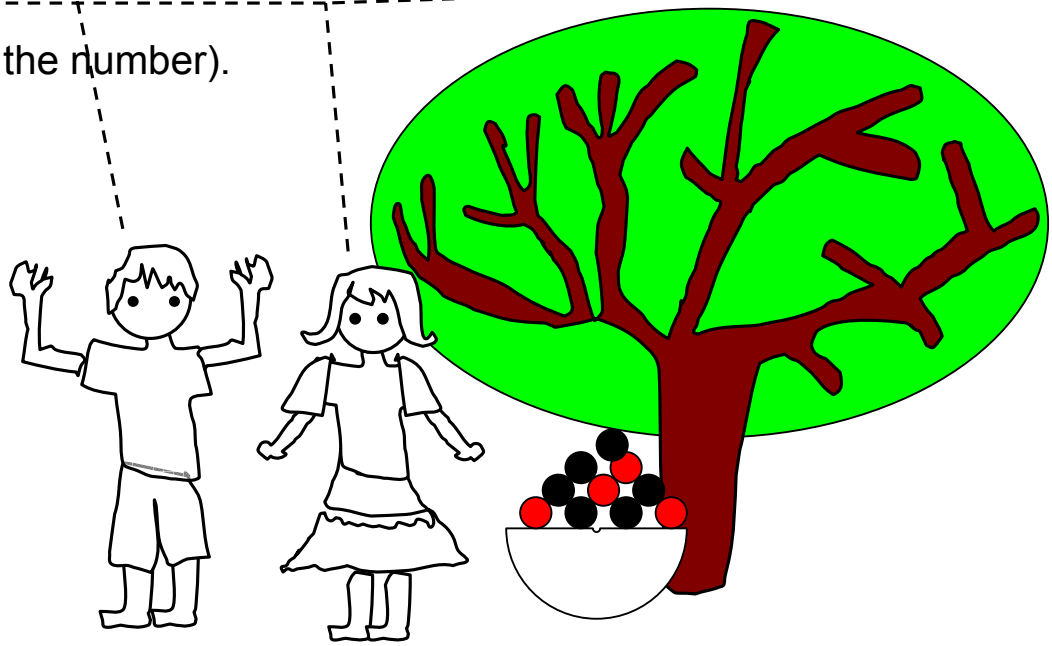


CHERISHED CHERRIES

We have picked a total of 54 cherries.

Yes, and if I give you enough to double your share, and then you give me enough to increase my share by half, our two shares will be equal. Because at the moment I have ____ more cherries than you do.

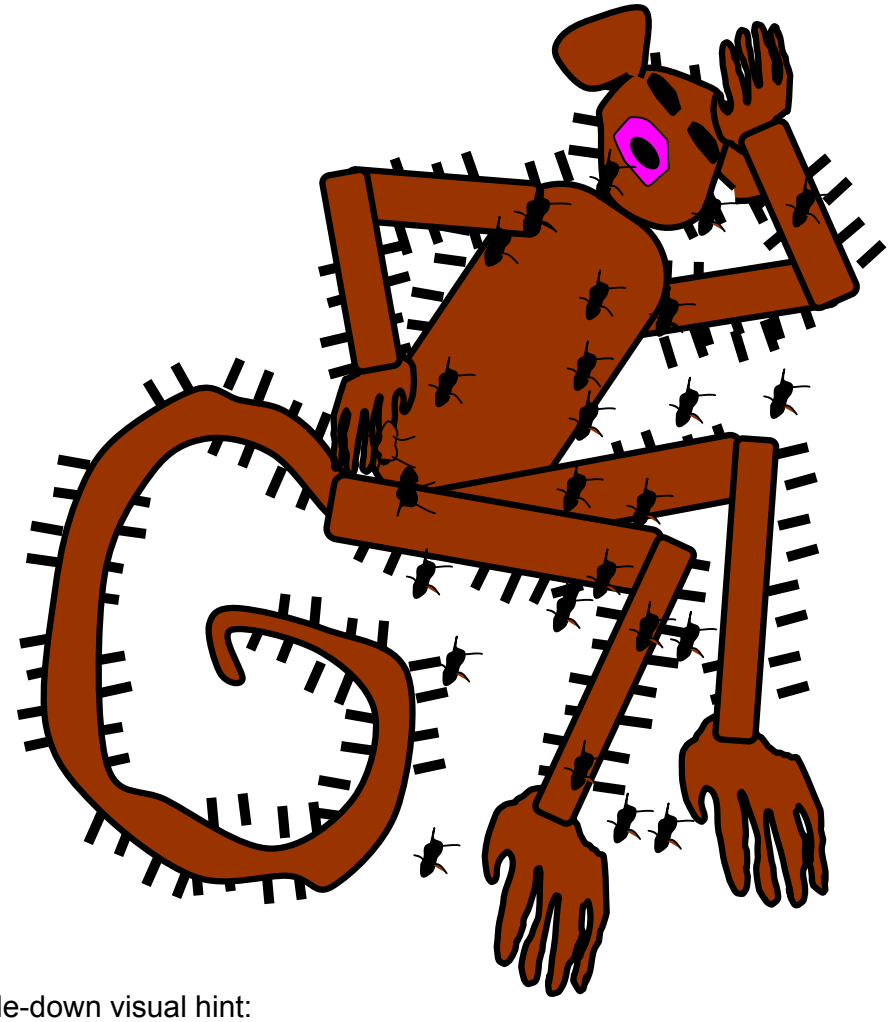
(Fill in the number).



Upside-down hint:
M is my share and T is yours.
We then have M – T and 2T. Then …

FLEAS ON THE MARMOSETS

If five-sixths of marmosets with fleas scratch, if five-sevenths of marmosets who scratch have fleas, and two-thirds of marmosets who don't scratch don't have fleas, what percent of marmosets scratch among those who don't have fleas?

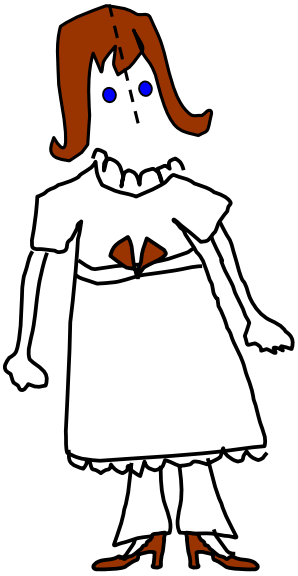


Upside-down visual hint:
Fill out the diagram bit by bit

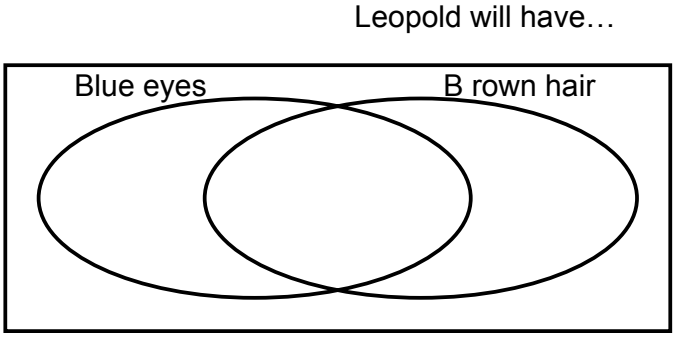
	Marmosets with fleas	Marmosets without fleas
Who scratch		
Who don't scratch		

LEOPOLD OR ELVIS PRESLEY

I'm expecting a baby. It's a boy, and I'll call him Leopold. According to very complex genetic laws, there is one chance out of 4 that he'll have brown hair, one chance out of 2 that he will have blue eyes, and one chance out of 3 that he will have neither brown hair nor blue eyes. What percent chance does Leopold have to have brown hair and blue eyes like Elvis Presley?



Visual hint:



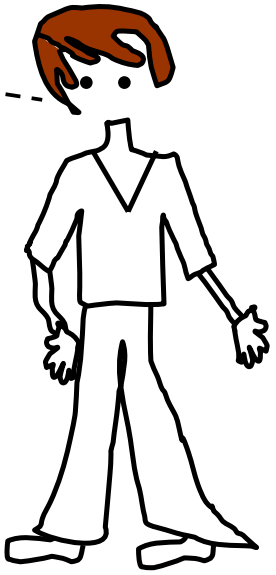
TURKS LIVE FOREVER

In my part of Turkey, we always live to be very old and everyone has 4 children just before turning 30. I myself am in terrific shape and about to celebrate my 120th birthday. My wife and I plan to invite all my direct descendants with their spouses and no one else, because I'd like to keep things intimate. I've reserved a room for 400 people. Have I overdone things?

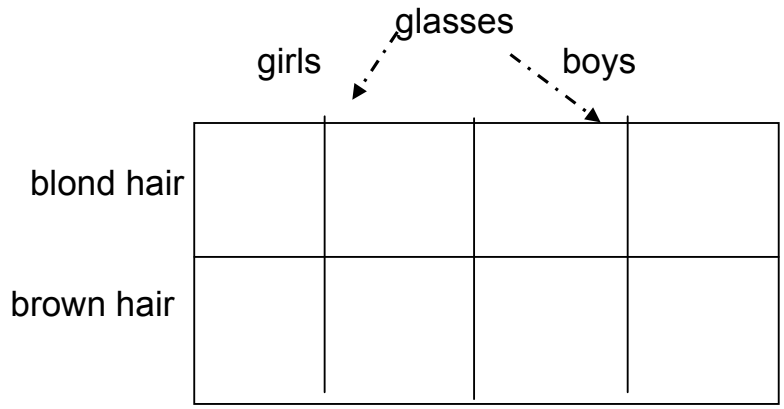
Upside-down hint:
First look at my direct descendants, then their spouses. .

THE GANG OF 13

In our crowd, there are 8 girls and 5 boys, 6 with blond hair and 7 with brown hair, 5 with glasses and 8 without. Thus we have 3 blond girls, 3 girls with glasses, and two blond heads with glasses. I have brown hair with no glasses and I'm the only one. I just love blonde girls with glasses. How many can I flirt with?

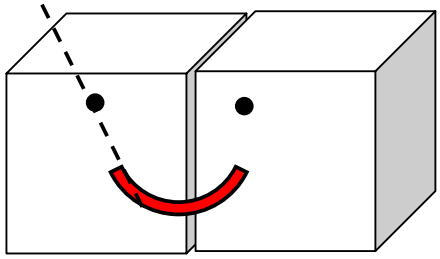


Visual hint:



ARITHMETIC MYSTERY

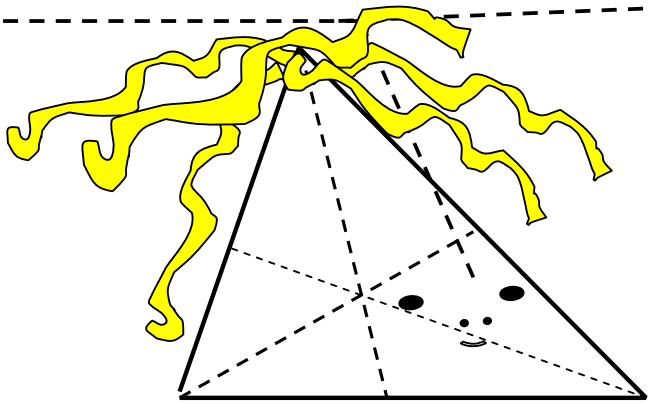
I am a double-digit number equal to the product of my 2 digits, that is _____ …



Upside-down hint:
D is the figure in the tens position and U is for the units position So we have…

ELEVEN SEVENTHS OF THE PERIMETER

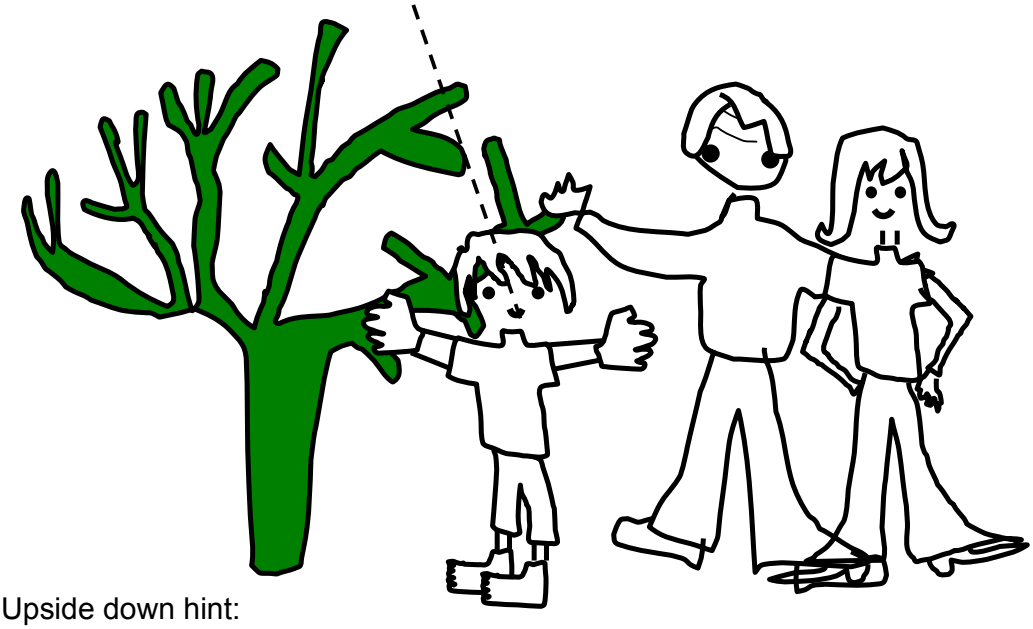
I am a blonde triangle. The total length of my three medians is greater than 11 times the 7^{th} of my perimeter. Do you think I'm lying?



Upside-down hint:
Apply the triangular inequality 3 times.

MOM, DAD, ME and THE TALUS

Today, Dad is one-third older than he was when he broke his talus. I was only three years old at the time. Today, I'm half the age Mom was when Dad broke his talus. And when I'll be half as old as Dad is today, Dad, Mom, and I will be 99 years old altogether. Because Dad broke his talus _____ years ago.
(Find the missing number)



Upside down hint:
D and M are the ages of Dad and Mom when Dad broke his talus.
X is the number of years that have passed since the fracture.
We are…

FACIT

- 1 €
- You
- 1%
- breakfast
- 42
- 63°
- Your age.
- 9n = 10 (n-1) + (10-n)
- 3
- first basket
- in my room
- going by boat
- 4 cm
- 200m
- 1111111
- 1 chance out of 30
- 3 cm
- 8
- 18
- 50%
- No it is not big enough.
- 36
- yes
- 9 years ago.