1. I Do, I Do . . .

WARNING: This puzzle is rated "difficult" and will require time to reach a correct solution.

Four women each married a man on the same day in the same city, but each wedding differed in form from the others, to reflect the shared religious beliefs of each couple.

One was a civil service at a registry office; another followed Druidic rites and was performed in a private home; the Hindu couple had their wedding in an ashram; while one couple chose the full nuptial Mass in a Catholic church.

Ark Road, Bee Street, Cedar Way and Dune Drive all run North-South, parallel to each other and are in that order consecutively from East to West.

Deduce the names of each couple, the form of wedding ceremony they chose and the street in which each ceremony took place.

	Ava	Bella	Chloe	Del	Ark Road	Bee Street	Cedar Way	Dune Drive	Civil	Druid	Hindu	Mass
Archie												
Beau												
Caleb												
Dylan												
Civil												
Druid												
Hindu												
Mass												
Ark Road												
Bee Street												
Cedar Way												
Dune Drive												

(i). Only one couple shared the same initial; they opted for a civil ceremony.

(ii). None of the streets where the ceremonies were performed had names beginning with the same initial as either person married there.

(iii). Archie is not a Druid or a Catholic.

(iv). The ashram is not on Ark Road, and was the wedding venue for neither Ava nor Del.

(v). Concerning Chloe and Dylan: one participated in a mass, while the other had his or her wedding at the Ark Road site.

(vi). Ava is not a Catholic. Caleb did not go through a civil ceremony. Bella wasn't married at the Dune Drive site.

(vii). Beau and Caleb weren't married in venues in consecutive streets.

2. How Many Triangles?
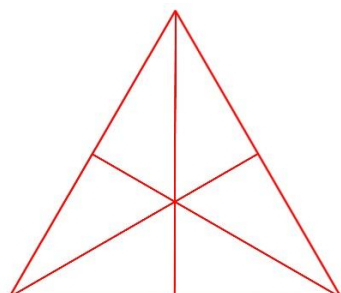
What is the total number of triangles in this figure?

Circling the Globe

3.

The circumference of the Earth is approximately 40,000 kilometers, and someone has just made a metal band that circles the Earth, touching the ground at all locations.

You come along at night, as a practical joke, and insert just 10 meters into the band to increase its length (by one hundredth of one kilometer!)
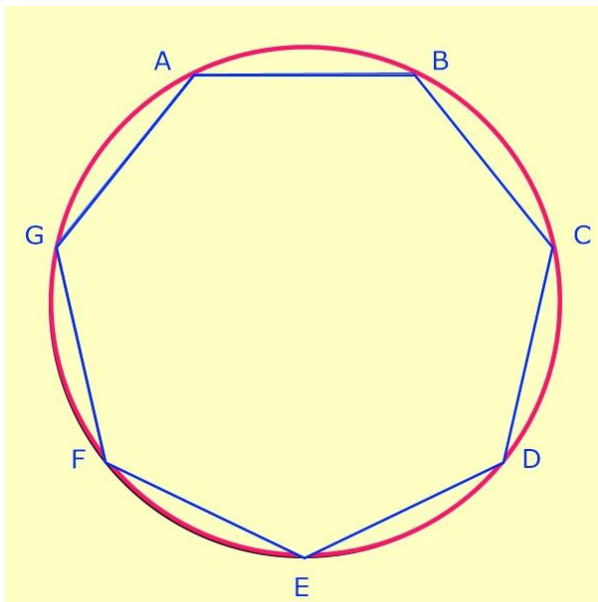
It is now one four-millionth longer than previously, and hovers magically just above the ground at all locations.

How far has it risen ...

a. Could a flea walk under it?
b. Could a rabbit walk under it?
c. Could a man walk under it?

Which Is Quicker?

4.

A courier service based at town A makes a daily run stopping at towns B, C, D, E, F & G before returning home.

The seven towns are situated equidistantly around a circular ring road (red), but a straight service road (blue) also links each town with the next.

The courier has a choice of using the linking roads at an average of 70 km / h, or the ring road at an average 80 km / h.

Assuming he stops at each town for the same period regardless of which road he uses, which of the two choices of road should be quicker: linking roads or ring road?

Figure It Out

5.

A man and a woman are sitting next to each other while each filling out a questionnaire.
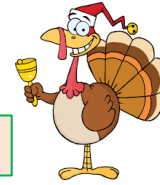
"*I am a man*" writes the one on the left.

"*I am a woman*" writes the one on the right.

At least one of them is lying.

Who is the man and who is the woman?

6.

Xmas Birds

According to the traditional song, on the first day of Christmas (25th December), my true love sent to me a partridge in a pear tree.

On the second day of Christmas my true love sent two turtle doves and a partridge in a pear tree. So to this stage, four birds have been accumulated. (Two doves, two partridges).

If the song holds true, and they all survive: how many birds will I receive altogether?

(Reminder: On the 12th and final day you get Twelve drummers drumming, Eleven pipers piping, Ten lords a-leaping, Nine ladies dancing, Eight maids a-milking, Seven swans a-swimming, Six geese a-laying, Five gold rings, Four calling birds, Three French hens, Two turtle doves and a partridge in a pear tree)

7.

Figure It Out

I have a family photograph album, which has one photo of each of my parents, each of my grandparents, all the way up to each of my great-great-grandparents.

How many photos is that?

8.

Serial Shopping

A shopper makes three successive purchases at different stores.

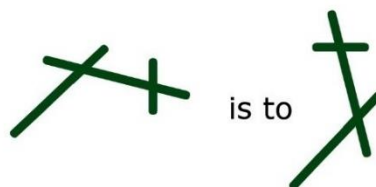Each time, she spends 75% of what she has.

After her third and last purchase, she still has $8 for a taxi home.
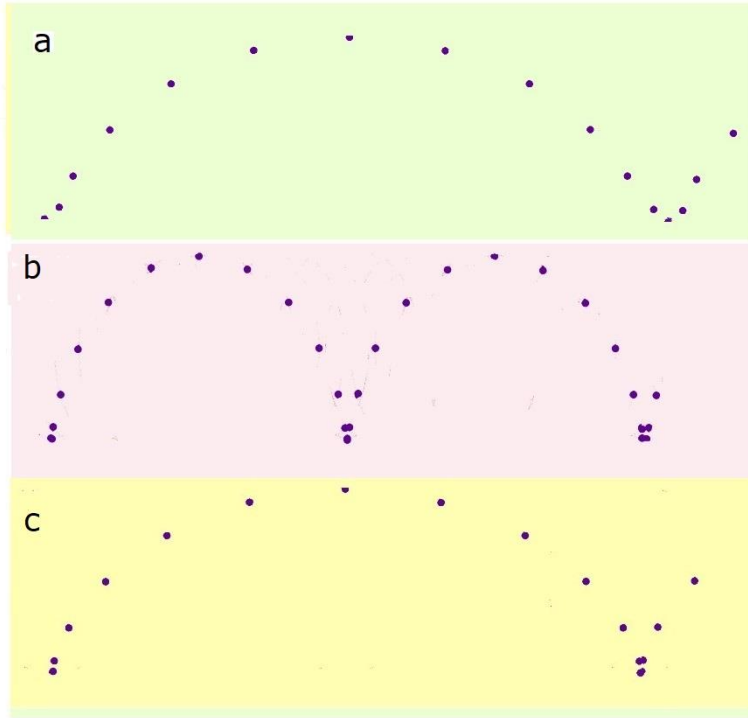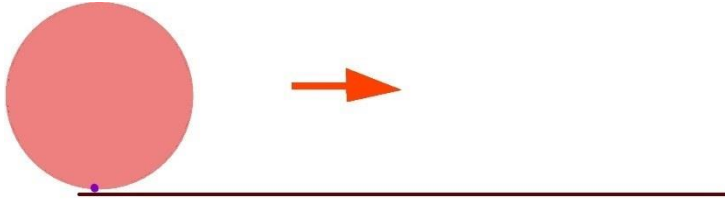
How much money did she start with?

9

KWICK KOMPARISON

10.

A wheel has a dot placed on its rim.

It is then allowed to roll on a horizontal surface from left to right.

To scale, which best represents the path traced out by the dot:

a

b

c

Answers next page

Answers:

Worked solutions begin on the next page.

1. Archie marries Bella in a Hindu Ceremony on Cedar Way
   Beau marries Chloe in a nuptial mass on Dune Drive
   Caleb marries Ava in a Druidic ceremony on Bee Street
   Dylan marries Del in a civil ceremony on Ark Road

2. 16 triangles

3. a. Yes   b. Yes   c. Yes (if he's over 1.6 m tall, he'll need to crouch)

4. The ring road is quicker

5. The one on the left is a woman, and the one on the right is a man.

6. 184 birds

7. 15 photos

8. $512

9. C

10. option **c**

SOLUTIONS:

1. One approach is to begin by filling in the information directly into the grid from the clues provided. It's also possible to deduce from Clues (i) and (vi) that if Caleb did not go through a civil ceremony, he did not marry Chloe. Chloe could not have gone through a civil ceremony either.

	Ava	Bella	Chloe	Del	Ark Rd	Bee St	Cedar Wy	Dune Dve	Civil	Druid	Hindu	Mass
Archie					X					X		X
Beau								X				
Caleb			X				X		X			
Dylan			X					X				
Civil			X									
Druid												
Hindu	X			X	X							
Mass	X				X							
Ark Rd	X											
Bee St		X										
Cedar Wy			X									
Dune Dve		X		X								

Either Chloe marries Archie (outcomes shown by ✓ & X) or she marries Beau. Let's try both suggestions, working through all the outcomes until we strike a contradiction.

Chloe marries Archie												
	Ava	Bella	Chloe	Del	Ark Rd	Bee St	Cedar Wy	Dune Dve	Civil	Druid	Hindu	Mass
Archie	X	X	✓	X	X	X	X	✓	X	X	✓	X
Beau			X	X	?	X	?	X			X	X
Caleb	X	X	X	✓	X	✓	X	X	X	X	X	✓
Dylan			X	X		X		X			X	X
Civil	X		X		✓	X	X	X				
Druid	✓	X	X	X	X	X	✓	X				
Hindu	X	X	✓	X	X	X	X	✓				
Mass	X		X		X	✓	X	X				
Ark Rd	X	✓	X	X								
Bee St	X	X	X	✓								
Cedar Wy	✓	X	X	X								
Dune Dve	X	X	✓	X								

This **fails** because of Clue (vii). Beau and Caleb are NOT married in consecutive streets.

Assume that "Chloe marries Beau" is the correct option and proceed.

	Ava	Bella	Chloe	Del	Ark Rd	Bee St	Cedar Wy	Dune Dve	Civil	Druid	Hindu	Mass
Archie			X		X					X		X
Beau	X	X	✓	X		X	X		X			
Caleb			X				X		X			
Dylan			X					X				
Civil			X									
Druid												
Hindu	X				X	X	X					
Mass	X				X							
Ark Rd	X											
Bee St		X	X									
Cedar Wy			X									
Dune Dve		X		X								

From clue (vii), either Beau or Caleb must have been married on Dune Drive. However, neither Beau or Caleb had a civil wedding. Therefore, the civil wedding did not take place on Dune Drive.

	Ava	Bella	Chloe	Del	Ark Rd	Bee St	Cedar Wy	Dune Dve	Civil	Druid	Hindu	Mass
Archie			X		X					X		X
Beau	X	X	✓	X		X	X		X			
Caleb			X				X		X			
Dylan			X					X				
Civil			X					X				
Druid												
Hindu	X				X	X	X					
Mass	X				X							
Ark Rd	X											
Bee St		X	X									
Cedar Wy			X									
Dune Dve		X		X								

Either Archie marries Ava in a civil ceremony, or Dylan marries Del in a civil ceremony. Let's try both options.

Archie marries Ava

	Ava	Bella	Chloe	Del	Ark Rd	Bee St	Cedar Wy	Dune Dve	Civil	Druid	Hindu	Mass
Archie	✓	X	X	X	X			X	✓	X	X	X
Beau	X	X	✓	X	X	X	X	✓	X	X		
Caleb	X	X	X	✓			X	X	X		X	
Dylan	X	✓	X	X		X		X	X			
Civil	✓	X	X	X	X			X				
Druid	X		X		✓	X	X	X				
Hindu	X			X	X	X						
Mass	X				X							
Ark Rd	X		X									
Bee St		X	X									
Cedar Wy			X	X								
Dune Dve	X	X	✓	X								

Dylan marries Del

|	Ava	Bella	Chloe	Del	Ark Rd	Bee St	Cedar Wy	Dune Dve	Civil	Druid	Hindu	Mass
Archie	X	✓	X	X	X	X	✓	X	X	X	✓	X
Beau	X	X	✓	X	X	X	X	✓	X	X	X	✓
Caleb	✓	X	X	X	X	✓	X	X	X	✓	X	X
Dylan	X	X	X	✓	✓	X	X	X	✓	X	X	X
Civil	X	X	X	✓	✓	X	X	X				
Druid	✓	X	X	X	X	X	✓	X				
Hindu	X	✓	X	X	X	X	✓	X				
Mass	X	X	✓	X	X	X	X	✓				
Ark Rd	X	X	X	✓								
Bee St	✓	X	X	X								
Cedar Wy	X	✓	X	X								
Dune Dve	X	X	✓	X								

If this is correct so far, from clue (v), since Chloe and Beau were not married at the Ark Road site, they must have had the nuptial mass. Dylan and Bella must have been married in Ark Road

	Ava	Bella	Chloe	Del	Ark Rd	Bee St	Cedar Wy	Dune Dve	Civil	Druid	Hindu	Mass
Archie	✓	X	X	X	X	X	✓	X	✓	X	X	X
Beau	X	X	✓	X	X	X	X	✓	X	X	X	✓
Caleb	X	X	X	✓	X	✓	X	X	X	✓	X	X
Dylan	X	✓	X	X	✓	X	X	X	X	X	?	X
Civil	✓	X	X	X	X	X	✓	X				
Druid	X	X	X	✓	✓	X	X	X				
Hindu	X	?		X	X	X	X					
Mass	X			X	X		✓					
Ark Rd	X	✓	X	X								
Bee St	✓	X	X	✓								
Cedar Wy	✓	X	X	X								
Dune Dve	X	X	✓	X								

This option leads to a consistent solution.

This option leads to Dylan and Bella having a Hindu wedding in Ark Road; but the Ashram is NOT in Ark road. This option does not work

2.

6 of these   +   3 of these   +   6 of these   +   1 of these
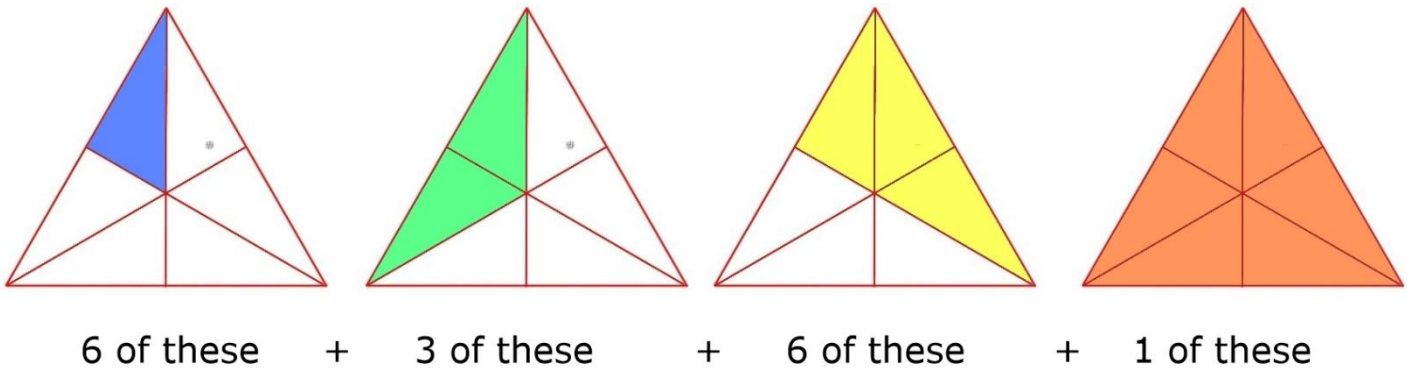
3. The circumference of any circle is Π X its diameter. Originally the circumference of the band was that of the earth. By making the band 10 m greater in circumference, you increase its diameter by 10 / Π metres or about 3.2 metres. That would have the effect of raising it about 1.6 metres above the earth's surface.

4. To solve this puzzle, we need the relative lengths the circumference of the ring road compared to the total distance from town A back to town A using the seven connecting roads.
   The diagram is that of a regular heptagon (7-sided figure) inscribed in a circle.
   There's a formula that gives the value of each interior angle of a regular polygon.
   It's 180(n−2)/n where n is the number of sides.
   So for a regular heptagon, each interior angle is 180(n−2)n = 900/7 or ~ 128.57^0
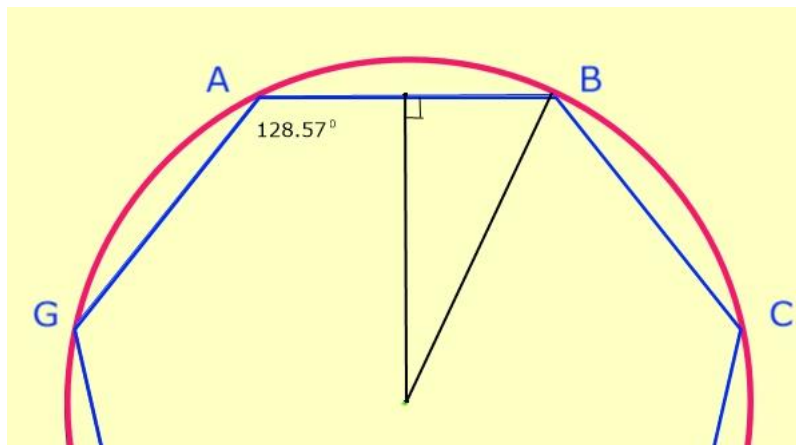
We can use that to calculate the straight-line distance between one town and the next. From the diagram, we can see that a right-angled triangle drawn from the centre of the ring road to point B and bisecting the connecting road between town A and town B has the radius of the ring road as its hypotenuse. Let's call that distance r km.

The angle subtended at the centre of the ring road's circle

= 180 − 90 − 128.57/2

= 25.71^0

The length of line AB = 2 r Sin 25.71^0

~ 2 X 0.434 r

~ 0.868 r.

The distance around the seven towns using the connecting roads is approximately 7 X 0.868r or 6.073r km. At 70 km / h that would take approx. 0.0868 r hours.

The distance using the ring road is 2Πr or about 6.28r km. At 80 km/h that would take approx. 0.0785 r hours.

The ring road is quicker.

5. Since at least one of them lied, the only possibility is that they both lied, otherwise they would be both men or both women.

6.

| Day	partridges	Turtle doves	French hens	Calling birds	Geese	Swans	Total
				Birds received			
1	1						1
2	1	2					3
3	1	2	3				6
4	1	2	3	4			10
5	1	2	3	4			10
6	1	2	3	4	6		16
7	1	2	3	4	6	7	23
8	1	2	3	4	6	7	23
9	1	2	3	4	6	7	23
10	1	2	3	4	6	7	23
11	1	2	3	4	6	7	23
12	1	2	3	4	6	7	23
						Grand total	184

7. 1 photo of parents + 2 photos of grandparents + 4 photos of great-grandparents + 8 photos of great-great grandparents = 15 photos

8. Working backwards, if $8 is the amount left after the last purchase, it represents 25% of the amount the shopper had just before the third purchase, which must have been $32.
If $32 is the amount left after the second purchase, it represents 25% of the amount the shopper had just before the second purchase, which must have been $128.
If $128 is the amount left after the first purchase, it represents 25% of the amount the shopper had to begin with, which must have been $512.
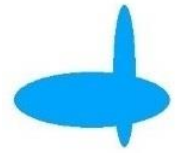
9. To transform
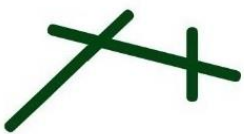
to

The image must be rotated 90^0 to the left and reflected (flipped) horizontally in either order.

Rotating to the left and reflecting horizontally produces

which is option C.

10. One rotation of the wheel will cause the dot to return to the surface a distance of Π (pi) times its height (diameter). In other words, the wheel will progress from left to right a distance a bit over 3 times its diameter.

That eliminates option **b**.

Options **a** & **c** differ only slightly in that:

- the distance travelled by the wheel in option **a** appears slightly greater than in option **c**. That could only be tested by careful measurement.
- In option **a**, the path taken by the point as it approaches, touches and leaves the surface is a smooth "U" shaped curve. In option **c**, it is a sharp descent, followed by an equally sharp ascent. If you consider that at any stage the wheel can be said to be "hingeing" around its contact point with the ground, option **c** is more realistic.