



VIC SKEPTICS

Logic and Maths Puzzles 81 April 2019

1. My history group has been researching four particular shipwrecks along the South West Victorian coast.

- The *Royal Oak* was either transporting emigrants or carrying gold.
- The *Bristol* was wrecked either in 1853 or 1889.
- Of the emigrants' ship and the ship carrying wool, one met her doom in 1871 and the other was the *Colt*.
- The *Daisy* sank 18 years before the *Colt*.
- The ship carrying coal sank sometime after the vessel carrying gold

	<i>Bristol</i>	<i>Colt</i>	<i>Daisy</i>	<i>Royal Oak</i>	Coal	Gold	Emigrants	Wool
1853								
1871								
1889								
1907								
Coal								
Gold								
Emigrants								
Wool								

From the clues above, match ships, dates and cargoes then answer each of the following questions for one point each:

- Which ship was the last of the four to be wrecked?
- Identify the emigrant's ship.
- In which year did the coal carrier founder?

2. Beverley wants to save \$50 to buy her mum a gift.

On Day 1 she puts 10 cents in her piggy bank.

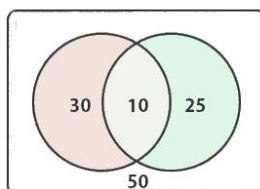
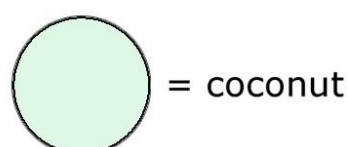
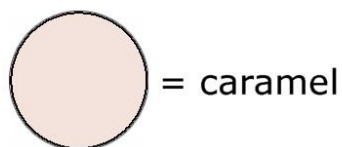
On Day 2 she puts 10 cents plus a further 20 cents in her piggy bank.

On Day 3 she puts 10 cents plus 20 cents plus a further 30 cents in her piggy bank, and so on.

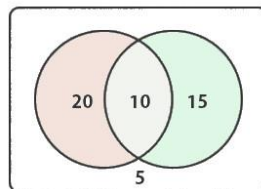
Following this pattern, on which day will she pass her savings goal?

3. There are 50 chocolates in a box; 30 have caramel in their filling; 25 have coconut in their filling; 10 have both caramel and coconut, and the rest are plain; no filling.

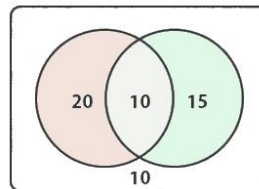
Which of the following Venn diagrams best illustrates that: A, B, C or D?



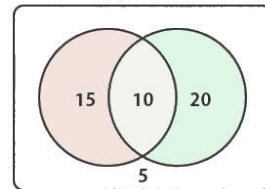
A



B



C



D

4. In order to complete a DIY concreting job I first carried some sand to the job site as full buckets.

I mixed in five sixths of the sand, (which was not quite enough) so I added another half bucket.

On finishing the job I still had a bucket of sand left over.

How many buckets of sand did I carry to the job site?

5. The three Smith children decide to shell a kilogram of peas. Working by themselves, it takes the eldest child 20 minutes, the middle child 25 minutes and the youngest child 50 minutes to shell that many peas.

How long should it take (to the nearest minute) if they work cooperatively?

6. Zig and Zag have 15 ice creams between them.

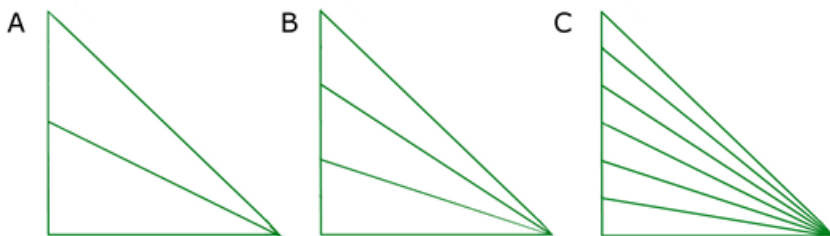
If Zig managed to increase his ice cream tally by 50% he would have five more than Zag has now.

How many ice creams do they each have?

7. One half of a certain number plus one quarter of the same number equals three less than the number. What is the number?

8. Eight times a certain number exceeds half that number by 15. What's the number?

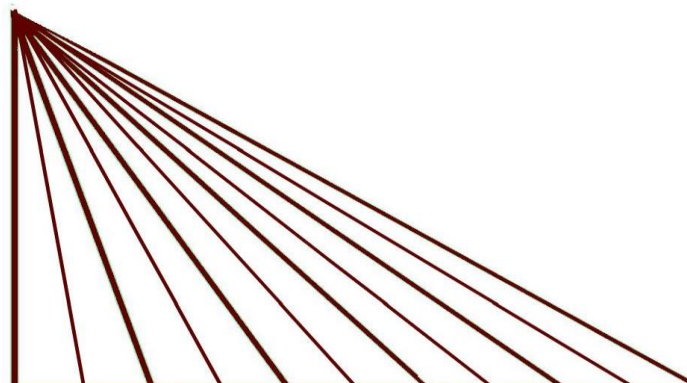
9.



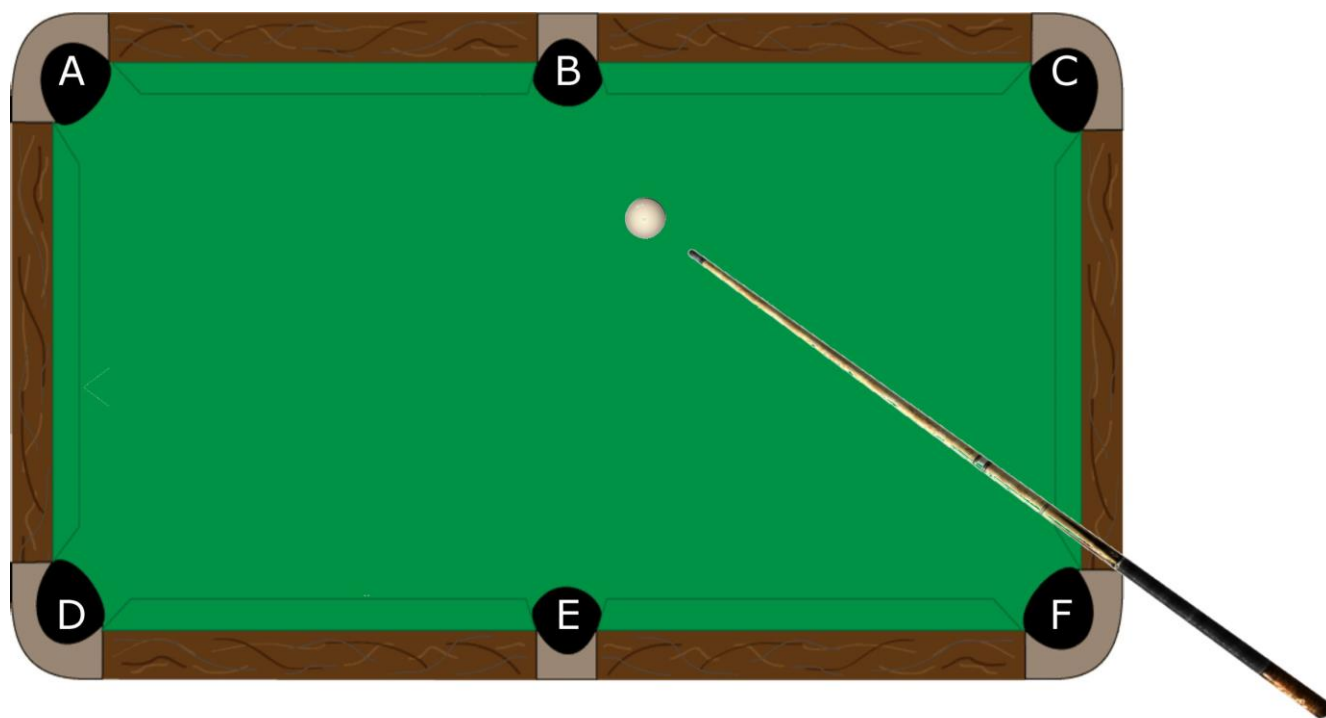
The total number of triangles in each diagram on the left are:

A. 3 B. 6 C. 21

Look for a pattern or rule, then calculate (don't count) the total number of triangles in the figure below



10.



Assuming it is struck with correct weight and no "side" and the cushions are playing true, into which pocket will the cue ball drop?

Answers:

1. a. The Colt b. The Royal Oak c. 1889

2. Day 14

3. Diagram B

If 30 chocolates contain caramel, and 10 contain a mixture of caramel and coconut, then to calculate the ones containing JUST caramel = $30 - 10 = 20$.

If 25 chocolates contain coconut, and 10 contain a mixture of caramel and coconut, then to calculate the ones containing JUST coconut = $25 - 10 = 15$.

So the sum of the chocolates that contain JUST caramel + the chocolates that contain JUST coconut + the chocolates that contain a mixture of caramel and coconut = $20 + 15 + 10 = 45$.

The number of plain chocolates = $50 - 45 = 5$

4. 9 buckets

Let the number of buckets I allowed to equal b

$$\text{Then } 5b/6 + 1/2 + 1 = b$$

$$5b/6 + 1 \frac{1}{2} = b$$

Multiplying through by 6:

$$5b + 9 = 6b$$

$$6b - 5b = 9$$

$$b = 9$$

5. 9 minutes

First calculate the relative rate at which each child can shell peas. The amount of peas able to be shelled in a given time is additive.

One possible approach is as follows:

Oldest child shells 1000g of peas in 20 minutes. That's $1000 \div 20 = 50\text{g} / \text{min}$

Middle child shells 1000g of peas in 25 minutes. That's $1000 \div 25 = 40\text{g} / \text{min}$

Youngest child shells 1000g of peas in 50 minutes. That's $1000 \div 50 = 20\text{g} / \text{min}$

So working together they can shell $50 + 40 + 20 = 110\text{g} / \text{min}$

It will take them $1000 \div 110 = 9.09$ minutes to shell 1 kg of peas.

6. Zig has 8 ice creams, Zag has 7

Let the number of ice creams Zig and Zag now have be Zi and Za respectively.

$$\text{Then } Zi + Za = 15$$

$$\text{And } 3Zi / 2 = Za + 5$$

$$\text{Substituting } Zi = 15 - Za$$

$$3 \times (15 - Za) / 2 = Za + 5$$

$$45 - 3Za = 2Za + 10$$

$$35 = 5 Z_a$$

$$Z_a = 7$$

So Zag has 7 ice creams, Zig has 8

Proof: If Zig increased his ice creams by 50% he would have 12, which is 5 more than Zag has

7. 12

8. 2

9. 55

$$(10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 55)$$

10. Pocket C

