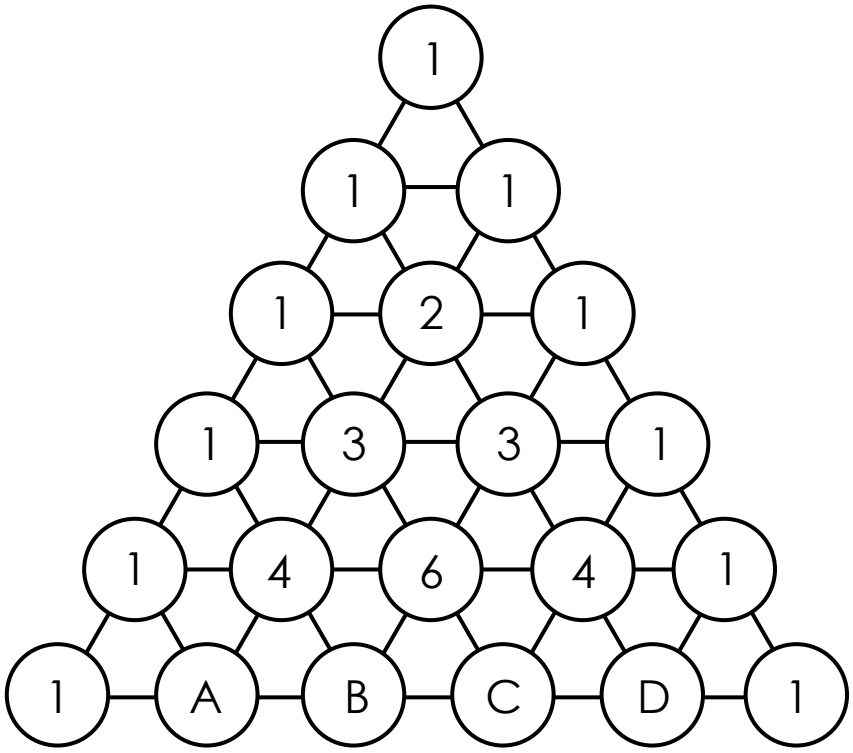
Junior Maths Mastery Challenge Sample

Paper A

Section A

Questions 1 to 5 carry 3 marks each.

1. Study the pattern below.



What is the value of A + B + C + D?

A = 1 + 4 = 5
B = 4 + 6 = 10
C = 6 + 4 = 10
D = 4 + 1 = 5
5 + 10 + 10 + 5 = 30

[Addition and Within Subtraction Within 100 / Look for Patterns]

(A) 22 (B) 24 (C) 26
(D) 28 (E) 30

2. Paul has 10 cookies to put on 3 plates such that each plate has a different number of cookies. How many ways can he put the cookies on the plates if each plate has at least 1 cookie?

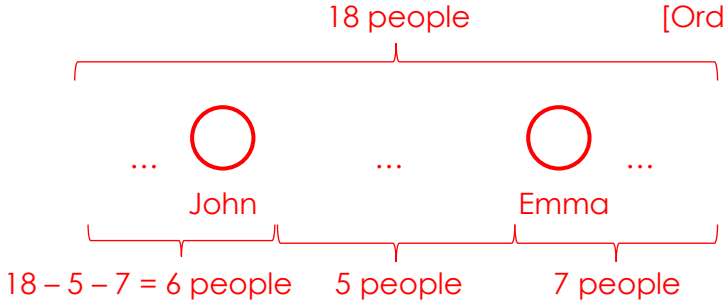
[Addition and Subtraction Within 100 / Make a List]

List all the ways Paul can distribute the cookies among 3 plates.
1) 1, 2 and 7
2) 1, 3 and 6
3) 1, 4 and 5
4) 2, 3 and 5

(A) 4 (B) 6 (C) 8
(D) 10 (E) 12

3. There are 18 people queueing for ice-cream. Emma is 7th in the queue. John is behind Emma. There are 5 people between them. What is John's position from behind?

[Ordinal Numbers / Draw a Diagram]

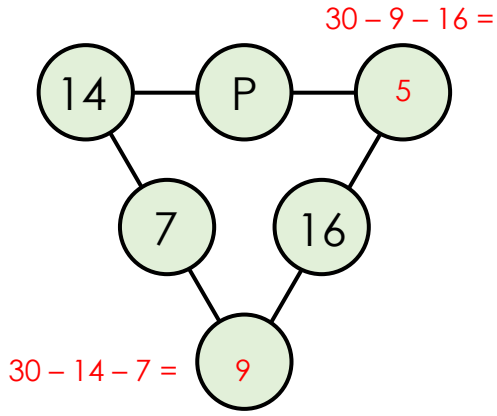


John is 6th from behind.

(A) 4th (B) 5th (C) 6th
(D) 12th (E) 13th

4. The three numbers along each side of the triangle add up to 30.
What number does the letter P stand for?

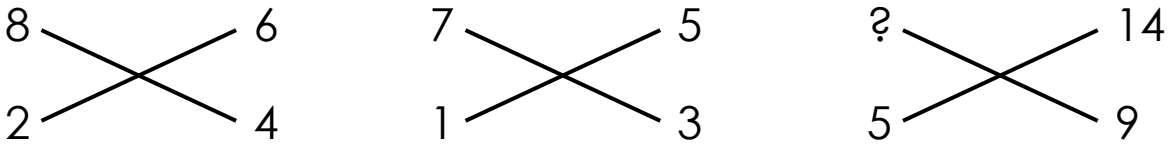
[Addition and Subtraction Within 100 / Logical Reasoning]



30 – 14 – 5 = 11
The letter P represents 11.

(A) 5 (B) 8 (C) 9
(D) 11 (E) 16

5. Find the missing number in the pattern below.



[Addition and Within Subtraction Within 100 / Look for Patterns]

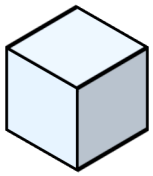
In each figure, the numbers on the left-hand side add up to the same number as the numbers on the right-hand side.
2 + 8 = 10 4 + 6 = 10

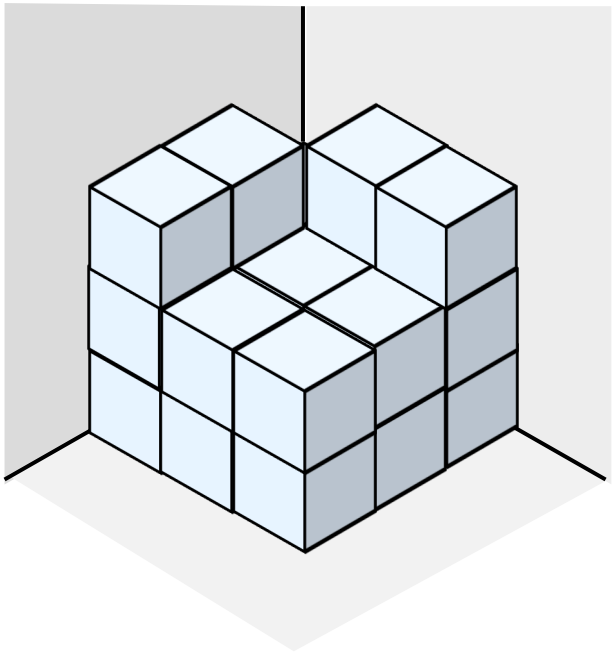
1 + 7 = 8 3 + 5 = 8

14 + 9 = 23
23 – 5 = 18

(A) 15 (B) 16 (C) 17
(D) 18 (E) 20

Questions 6 to 10 carry 4 marks each.

6. What is the greatest possible number of  in the figure? [Spatial Visualisation]



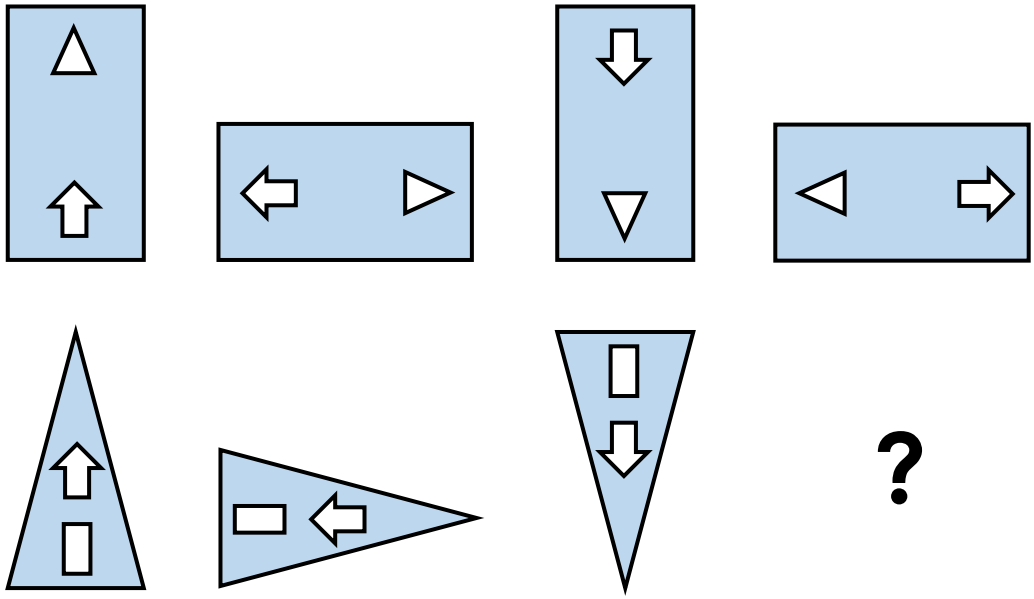
The greatest possible number of cubes that can form the figure is with 2 layers of 9 cubes and 4 cubes in the top layer.

9 + 9 + 4 = 22
The greatest possible number of cubes in the figure is 22.

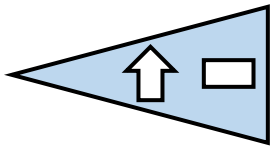
(A) 20 (B) 21 (C) 22

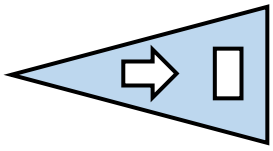
(D) 23 (E) 24

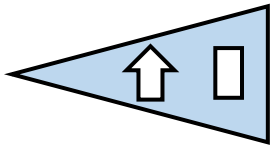
7. Study the figures below.

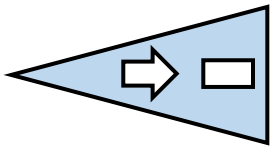


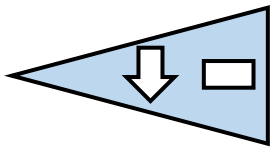
What figure comes next? [Shapes / Look for Patterns]

(A) 

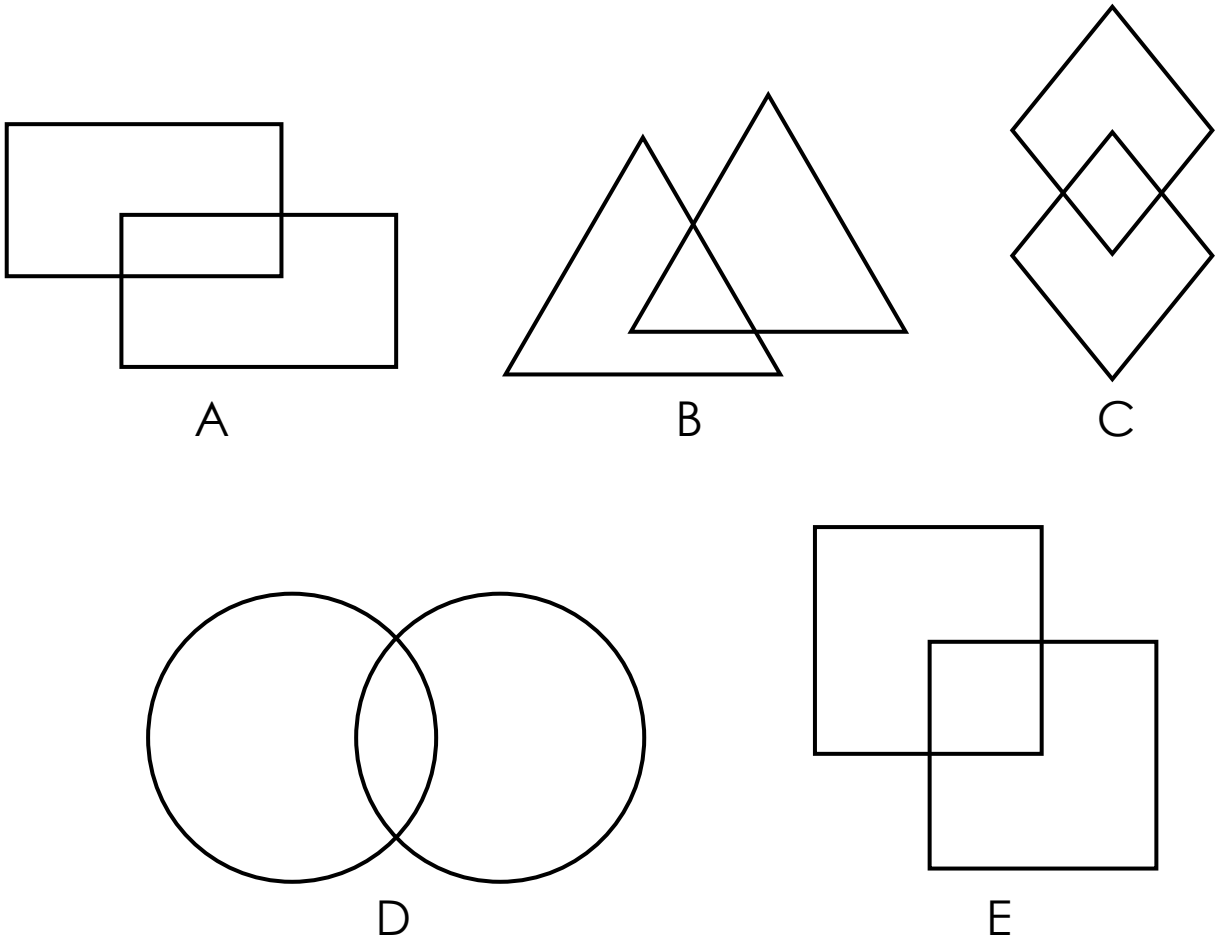
(B) 

(C) 

(D) 

(E) 

8. Study the figures below.



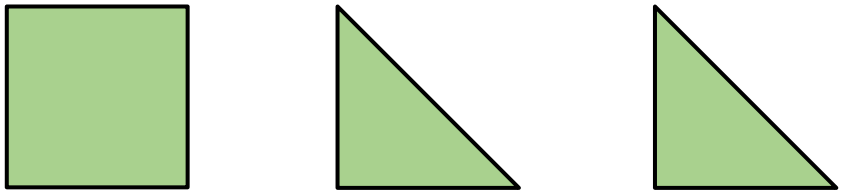
[Shapes / Look for Patterns]

Which figure is the odd one out?

Each figure is made up of two same shapes. The overlapped part is of the same shape as the two shapes. Figure D is made up of two circles but the overlapped part is not a circle. So, Figure D is the odd one out.

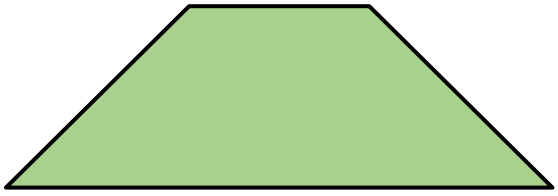
(A) Figure A (B) Figure B (C) Figure C
(D) Figure D (E) Figure E

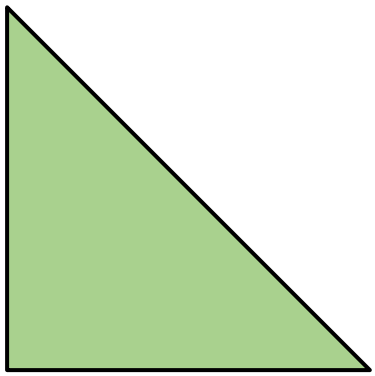
9. Study the shapes below.

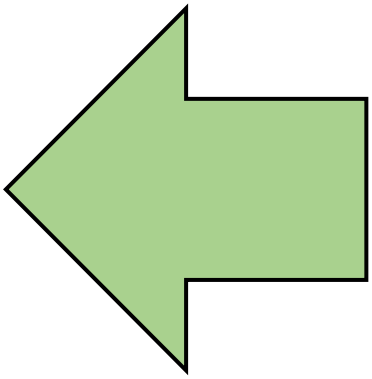


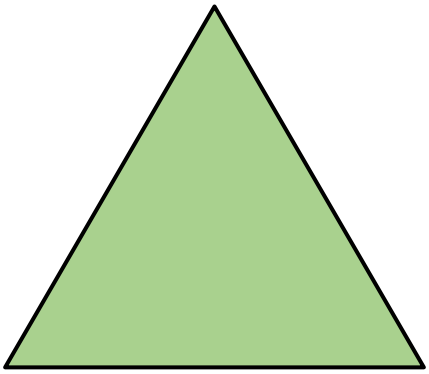
Which of the following **cannot** be formed by the shapes? [Shapes / Spatial Visualisation]

(A) 

(B) 

(C) 

(D) 

(E) 

10. Mrs Brown left an apple on the table.
When she came back, the apple had been eaten by one of her children, Joe, Lina or Tom.

Joe said, 'Lina ate the apple.'
Lina said, 'Tom ate the apple.'
Tom said, 'Lina was lying.'

[Logical Reasoning]

Only one of them lied. Which of the following statements is **true**?

If Joe was telling the truth, then Lina ate the apple.
This means that Lina was lying and Tom was telling the truth.
So, it is possible that Lina was the only one who lied and she ate the apple.

If Lina was telling the truth, then Tom ate the apple.
This means Joe and Tom were lying.
This is not possible.

If Tom was telling the truth, then Lina was lying. Tom did not eat the apple.
This means Joe was telling the truth and Lina ate the apple.
This brings us back to the first scenario that we arrived at.

Lina ate the apple and she was the one lying.

(A) Joe ate the apple.
(B) Lina was lying.
(C) Tom ate the apple.
(D) Tom was lying.
(E) None of the above

Section B

Questions 11 and 12 carry 6 marks each.

11. Each letter below stands for a different digit.

$$\begin{array}{cccc} & & S & A \\ + & M & A & \\ \hline & A & M & \end{array}$$

Find the greatest possible 2-digit number AM can stand for. [Addition and Subtraction Within 100 / Logical Reasoning]

Since SA + MA gives a 2-digit number, the greatest possible digit A can be is 9. If A = 9, then M = 8.
1 + S + 8 = 9 but S cannot be 0. So, A cannot be 9.

Let A = 8. So, M = 6.
1 + S + 6 = 8
This is possible.

Note that M is an even number because two of the same number added together is an even number.

So, S = 1.
The greatest possible 2-digit number AM can stand for is 86.

$$\begin{array}{cccc} & & {\scriptstyle 1} & \\ & & S & 8 \\ + & 6 & 8 & \\ \hline & 8 & 6 & \end{array}$$

$$\begin{array}{cccc} & & {\scriptstyle 1} & \\ & & 1 & 8 \\ + & 6 & 8 & \\ \hline & 8 & 6 & \end{array}$$

(A) 82 (B) 84 (C) 86

(D) 98 (E) None of the above

12. Numbers 1 to 100 are arranged in the pattern shown below.

	Column A	Column B	Column C	Column D	…
Row 1	1	10	11	20	…
Row 2	2	9	12	19	…
Row 3	3	8	13	18	…
Row 4	4	7	14	17	…
Row 5	5	6	15	16	…

In which row and column does 58 appear in?

10, 20, 30, 40, … appear in Row 1. [Numbers to 100 / Look for Patterns]
10 appears in Column B.
20 appears in Column D.
30 appears in Column F.
40 appears in Column H.
50 appears in Column J.
60 appears in Column L

If we count backwards, we will observe that 58 appears in Row 3.

So, 58 appears in Row 3 Column L.

(A) Row 2 Column K

(B) Row 4 Column K

(C) Row 2 Column L

(D) Row 3 Column M

(E) None of the above