

APMOPS 2014 Round 2

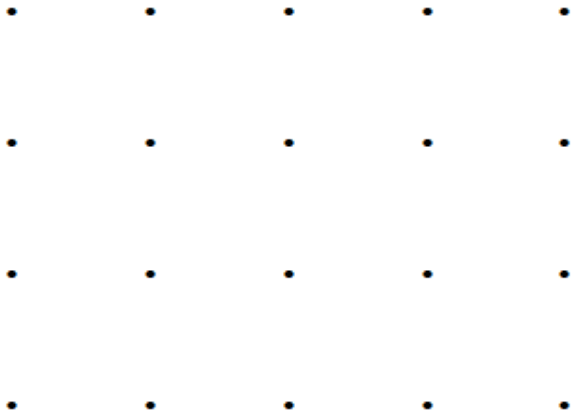
Time Duration: 2 hours

Name: _____

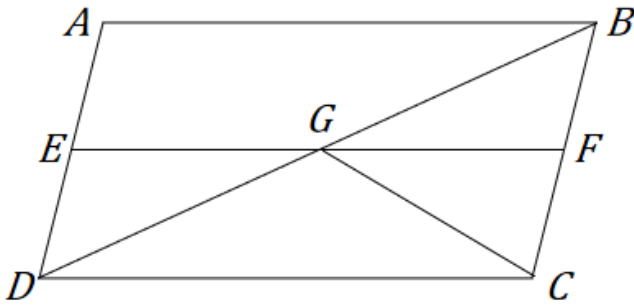
Marks: _____

1. John was finding the total of the numbers from 1 to n . However, he accidentally added one number twice, ending up with a wrong total of 3405. What number did he add twice?

2. Using 4 dots as vertices of a square, how many squares can be formed such that none of the sides of the formed square are parallel to the edges of the dots?



3. (Similar question) The figure below shows a parallelogram ABCD. The line EF is parallel to AB. Given the area of ABGE and CFG is 10.5 cm^2 and 4 cm^2 respectively. What is the area of the parallelogram ABCD?



4. In the three figures below, the numbers in a row are always ascending from left to right. The numbers in a column are also always ascending from top to bottom.

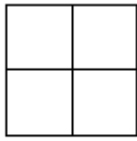


Figure 1

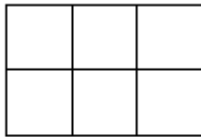


Figure 2

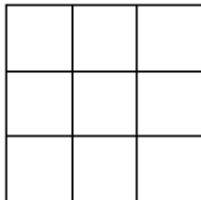
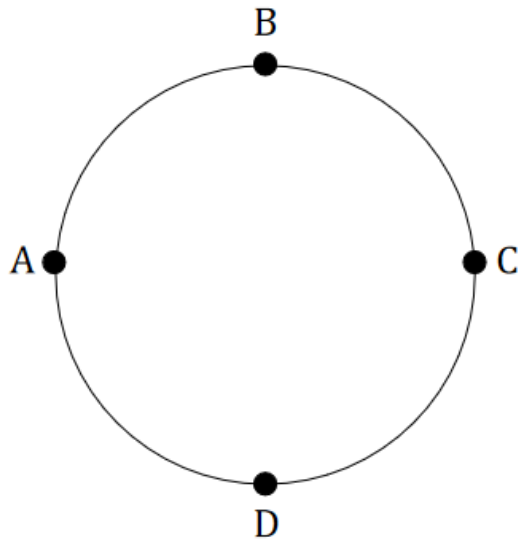


Figure 3

- (a) How many ways can the numbers from 1- 4 be placed in Figure 1?
- (b) How many ways can the numbers from 1- 6 be placed in Figure 2?
- (c) How many ways can the numbers from 1- 9 be placed in Figure 3?

5. If $26!$ is $4032914A112660B63558CD00000$, what is the value of A, B, C and D?

6. Alex and Ben are running on a circular track where the circumference is a whole number. Alex starts running from point C to point B then point A, and back to point C and so on. Ben starts running clockwise from point A and does this repeatedly.



If they start running at the same time, they will first meet 80 metres from point A and they will meet for a second time after a period of time, 120 metres from point A. Consider all scenarios, what is the circumference of the track?