

Determining How Many Regions In A Plane:

A. On a number sense test, there will be two scenarios:

1. No 3 lines are concurrent
2. Only 3 lines are concurrent

B. Formulas

1. In the case for no 3 lines being concurrent, the formula is: n^{th} triangular number + 1.
2. In the case for only 3 lines being concurrent, the formula is: n^{th} triangular number.

Note: See [*Triangular Numbers*](#).

C. Examples

Ex [1] How many regions in a plane are determined by 5 lines, no 2 are parallel and no 3 are concurrent? _____.

- a. The answer is the 5th triangular number plus 1 or $15+1 = 16$.
- b. The answer is 16.

Ex [2] How many regions in a plane are determined by 8 lines, no 2 are parallel and only 3 are concurrent? _____.

- a. The answer is the 8th triangular number or 36.
- b. The answer is 36.