mps

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1 theorem

2 Theorem

Theorem 2.1 *For any triangulated polygon, we can assign three colours to the vertex, so that all the vertex of any polygon may be expressed in three colours*

proof 2.2

Base Case:
Considering the very trivial case of a simple polygon [that is a triangle] where $n = 3$, we actually see that for each vertex we can assign a different colour.

The colouratiaon principle can then be extended for larger polygons $n = 4, 5, ..., k$ and this holds true as shown in the figure below.

3 Conclusion

The minimum number of guards required by brian to secure the entire perimeter of his farm is 7 as indicated by the red colours of the 24-sided polygons.

The number of guards required to cover any n-gon shaped field is proportional to the number of sides of the polygon, the solution is found by taking the floor of $\frac{n}{3}$ where n is the number of sides of the n-gon, however this value is not often the minimum number of guards required.