Diagonals of a Polygon

1) Draw a heptagon (7-sided polygon) and label the vertices ABCDEFG. Draw in the diagonals. How many are there?

2) In your heptagon,
   (i) How many diagonals can be drawn from the vertex A?
   (ii) How many vertices are there?
   (iii) Parts (i) and (ii) suggest that there are $4 \times 7 = 28$ diagonals. But in fact there are only 14. Why is this?

3) In a polygon with $n$ sides
   (i) How many diagonals can be drawn from the vertex A?
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   (iii) How many diagonals will there be altogether?

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