Mathematics Competition

1. The picture on the back side shows that one of the six parking space numbers is covered by a car. What is the missing parking space number under the car? **Justify your answer.**

2. Put 6 unsharpened pencils on the table so that every pencil touches every other one in at least one point. **Justify your answer.**

3. If you divide a cylindrical birthday cake by making exactly 4 cuts with a sharp knife, what is the maximal number of pieces you can get? **Justify your answer.**

4. Which number is bigger, A or B, and what is the ratio of the larger to the smaller? **Justify your answer.**
$$A = \left(\frac{1}{2} - \frac{1}{3}\right) \cdot \left(\frac{1}{4} - \frac{1}{5}\right) \cdot \left(\frac{1}{6} - \frac{1}{7}\right) \cdot \ \cdots \ \cdot \left(\frac{1}{96} - \frac{1}{97}\right) \cdot \left(\frac{1}{98} - \frac{1}{99}\right) ;$$
$$B = \left(\frac{1}{1} - \frac{1}{2}\right) \cdot \left(\frac{1}{3} - \frac{1}{4}\right) \cdot \left(\frac{1}{5} - \frac{1}{6}\right) \cdot \ \cdots \ \cdot \left(\frac{1}{97} - \frac{1}{98}\right) \cdot \left(\frac{1}{99} - \frac{1}{100}\right) .$$

5. Two <u>non-congruent</u> isosceles triangles have the same base angles and share a common side. How can <u>this happen</u> and what are the angles of each triangle? **Justify your answer.**

Direct any questions to Gregory Galperin, OM 3361.

Rules & Rewards

16 06 68 88 98

What is the missing parking space number under the car?