Warm-up problem: mental math

The sum $24 + 48 = 72$ and $32 + 36 = 68$. Which product is greater? 24×48 or 32×36? How much greater? Why?

Review Problems

1. Simplify $\sqrt{2 \cdot 3 \cdot 4 \cdot 5 \cdot 8 \cdot 9 \cdot 10}$ to the simplest radical form.

2. (Challenge) A positive integer n is called *square-free number* if its prime factorization does not contain any squares. For example, $30 = 2 \times 3 \times 5$ is a square-free number but $45 = 3^2 \times 5$ is not a square-free number.

Question: how many square-free numbers are there between 2 and 100?

Triangles, Quadrilaterals, and other Polygons

1. What is the sum of three interior angles of a triangle?

2. What is the sum of the exterior angles of a triangle?

3. What is the sum of the four interior angles of a quadrilateral if it is convex?

4. What is the sum of the four interior angles of a quadrilateral if it is not convex?

5. What is the sum of the interior angles of a convex pentagon? What if it is not convex?

6. What is the sum of the interior angles of a convex n-gon? What if it is not convex?

7. (Challenge) What is the sum of the three interior angles of a triangle you draw on a globe, see Earth?