1. In a right triangle, \(c\) is the length of the hypothenuse, \(a\) and \(b\) are the lengths of the two other sides, and \(d\) is the length of the diameter of the inscribed circle. Prove that
\[a + b = c + d.\]

2. Show that the expression
\[n^2(n^2 - 1)(n^2 - 4)\]
is divisible by 360 for \(n = 1, 2, 3, \ldots\).

3. Solve the system of three equations for the unknowns \(x, y,\) and \(z\), giving all solutions:
\[
\begin{align*}
x^2 + 5y^2 + 6z^2 + 8(yz + zx + xy) &= 36 \\
6x^2 + y^2 + 5z^2 + 8(yz + zx + xy) &= 36 \\
5x^2 + 6y^2 + z^2 + 8(yz + zx + xy) &= 36.
\end{align*}
\]
(One solution is easy to find.)

4. The base of a right prism is a regular hexagon, and the height of the prism is equal to the diameter of the circle inscribed in the base. The volume of the prism is equal to the volume of a regular octahedron.

Find the ratio of the surface-arias of these two solids.

Observe that the two solids have the same number of faces, and one of them is a regular solid, but the other is not. Any remark?