Zadatak 10. Duljine stranica trokuta jednake su n^2+n+1, $2n+1$ i n^2-1, gdje je n realan broj veći od 1. Koliki je kut nasuprot stranici duljine n^2+n+1?

Rješenje.

$$a = n^2+n+1$$
$$b = 2n+1$$
$$c = n^2-1$$

$$\alpha = ?$$

$$\cos\alpha = \frac{b^2+c^2-a^2}{2bc} = \frac{(2n+1)^2+(n^2-1)^2-(n^2+n+1)^2}{2(2n+1)(n^2-1)}$$
$$= \frac{4n^2+4n+1+n^4-2n^2+1-(n^4+n^2+1+2n^3+2n^2+2n)}{2(2n+1)(n^2-1)}$$
$$= \frac{2n^2+n^4+4n+2-n^4-3n^2-1-2n^3-2n}{2(2n+1)(n^2-1)} = \frac{-2n^3-n^2+2n+1}{2(2n+1)(n^2-1)}$$
$$= \frac{-n^2(2n+1)+(2n+1)}{2(2n+1)(n^2-1)} = \frac{-n^2+1}{2(n^2-1)} = -\frac{1}{2}$$

$$\alpha = 120^\circ.$$