A tentative to prove Andrica's conjecture

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Introduction:

This is a tentative to prove Andric's conjecture using Baker-Herman-Bintz Theorem, this tentative need to be check if it's correct and I need feedback from the readers about it.

For large p_n:

$$0 \le p_n^{0.025} - \frac{1}{p_n^{0.5}} - 2$$

Multiply both sides by $p_n^{0.5}$:

$$0 \le p_n^{0.525} - 1 - 2p_n^{0.5}$$

Multiply both sides by $p_n^{0.525} - 1 + 2p_n^{0.5}$
:

$$0 \le (p_n^{0.525} - 1 - 2p_n^{0.5})(p_n^{0.525} - 1 + 2p_n^{0.5})$$

$$0 \le p_n^{1.05} - 2p_n^{0.525} - 4p_n + 1$$

Multiply both sides by $p_n^{1.05}$:

$$0 \le p_n^{1.05} - 2p_n^{1.575} - 4p_n^{2.05} + p_n^{2.1}$$

Add $4(p_n^2 + p_n^{1.525})$ to both sides, we get:

$$4(p_n^2 + p_n^{1.525}) \le (2p_n + p_n^{0.525} - p_n^{1.05})^2$$

Pass the both sides to square root:

$$-2\sqrt{p_n^2 + p_n^{1.525}} \le 2\sqrt{p_n^2 + p_n^{1.525}} \le 2p_n + p_n^{0.525} - p_n^{1.05}$$

So:

$$p_n^{1.05} \leq 2p_n + p_n^{0.525} + 2\sqrt{p_n^2 + p_n^{1.525}}$$

$$p_n^{0.525} \leq \sqrt{p_n} + \sqrt{p_n^2 + p_n^{1.525}}$$

$$\frac{p_n^{0.525}}{\sqrt{p_n} + \sqrt{p_n + p_n^{0.525}}} \leq 1$$

Multiply by conjugate

$$\sqrt{p_n + p_n^{0.525}} - p_n^{0.525}$$

:

$$\sqrt{p_n + p_n^{0.525}} - \sqrt{p_n} \leq 1$$

Or By Theorem (Baker-Harman-Pintz, 2001) we know that:

$$p_{n+1} \leq p_n + p_n^{0.525+o(1)}$$

So:

$$\sqrt{p_{n+1}} - \sqrt{p_n} \leq \sqrt{p_n + p_n^{0.525}} - \sqrt{p_n} \leq 1$$

End.