

Problem of the Week-5

Given that

$$x + x^{-1} = 2 \cos\left(\frac{\pi}{5}\right) = \frac{1 + \sqrt{5}}{2}$$

find the value of

$$x^{2000} + x^{-2000}$$

As always, show your work, fully explain and justify your answer.
No calculators or computers.

Hint: Consider complex n th roots of unity.

Posting Date 3/17/14. Submit solutions to Noah Aydin, Mathematics Department, RBH 319 (e-mail or hard-copy, but hard copy submissions must include a time stamp) by 4 pm on 3/28/14.