Math 105 TOPICS IN MATHEMATICS  
REGULAR HOMEWORK – V  
February 9 (Mon), 2015

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Line #:    52920.

⋆ Due date:    Wednesday, February 11th, 2015.

⋆ Your paper will be collected in class. No late homework will be accepted.
    Please see “Rules, Policies and Protocols” p.14 about homework policy.

[I] (6pts) (1) 0^{12} =?   (2) 1^{24} =?   (3) \((-1)^{99}\) =?

[II] (6pts) Spell out each of the following binomial coefficients, in the fraction form. You don’t have to calculate the answers.

(1) \(_{4}^{11}\)   (2) \(_{7}^{24}\)   (3) \(_{12}^{100}\).

[III] (8pts) Spell out the binomial formula for each of

(a) \((x + y)^5\), and (b) \((x + y)^6\).

In each of (a), (b), first give the formula that includes the notation \(_{k}^{n}\). Then convert those \(_{k}^{n}\) into numbers and rewrite your answer accordingly.

[IV] (10pts) (1) \(2^{11} - 1\) is written as a product of two primes. One of the two primes is 23. What is the other prime? Show work.

(2) True or false : “If \(n\) is a prime, then \(2^n - 1\) is a prime.”

(3) True or false : “If \(2^n - 1\) is a prime, then \(n\) is a prime.”

(4) True or false : “If \(2^n + 1\) is a prime, then \(n\) is a 2-to-the-power.”

(5) Is \(2^{32} + 1\) a prime? If not, what is the smallest prime that divides \(2^{32} + 1\)?