

Playsheet 3

Primes

MATH 130-02
Tuesday, January 27, 2009

Directions: Groups should consist of three or four people. Work together on each problem; do not delegate different problems to different people. Submit one **neatly written** write-up per group. Remember to use complete sentences as appropriate and explain your reasoning. That is, **show your work!**

1. Factor 76230 into prime factors.
2. Express $48 \div 5$ in terms of the division algorithm. That is, find q and r such that $48 = 5q + r$ and $0 \leq r < 5$.
3. Construct a number (as in the proof of the infinitude of primes) that is not divisible by 2,3,4,5,6, or 7.
4. What is the smallest number n such that $n^2 - n + 5$ is not prime?
5. Suppose that n is a prime number that is greater than or equal to 3. Argue convincingly that $n + 1$ cannot be prime.
6. January 27, 2009 is a Tuesday. What day of the week will January 27, 2011 be? (Note that neither 2009 nor 2010 is a leap year.)
7. Express the first dozen even numbers greater than 2 as the sum of two primes. Also express 58 as the sum of two odd primes.