

Math 570 - Homework #4
Due Monday, February 20, 2006

1. Draw a picture that illustrates how Euclid would have solved

$$x^2 + 8x = 64.$$

2. Recall that Proposition II.5 of Euclid gives us the algebraic formula

$$a^2 - b^2 = (a + b)(a - b).$$

- Show that setting

$$a = \frac{x + y}{2}, \quad b = \frac{x - y}{2}$$

results in the equation

$$\left(\frac{x - y}{2}\right)^2 + xy = \left(\frac{x + y}{2}\right)^2.$$

- Show that if n is odd, then setting $x = n^2$ and $y = 1$ results in a Pythagorean triple. Why must n be odd?
 - Show that we also get a Pythagorean triple if $x = 2n^2$ and $y = 2$.
3. Use the Euclidean algorithm to find $\gcd(272, 1479)$.
 4. On page 184 of Burton, do problems 5, 6, 16(b), 17.