Solution Sheet 8, June 20, 2012

Answers

1. Use the fact that 1997^4 ends in a one. Answer is 7
2. 500
3. Pythagoras' Theorem.
4. Assume $x \leq y$, then $(7, 42), (8, 24), (9, 18), (10, 15), (12, 12)$. Repeat for x and y swapped.
5. (a) 1
   (b) The sum of the geometric series $S = 1-2+4-8+\ldots+(-2)^{n-1} = \frac{1-(-2)^n}{1-(-2)} = \frac{1+2^n}{3}$ since n is odd. Then $3S = 1+2^n$, so $1+2^n$ is divisible by 3. Similarly $1+2^m$ is divisible by 3. Hence the gcd is at least 3.
6. ... its a rectangle.