Present neatly on ~~separate paper~~. Justify for full credit. ~~No Calculators.~~

Name _____   Score _____   15 minutes

1.

Find two positive integers such that the sum of the first number and four times the second number is 1000 and the product of the numbers is as large as possible.

2.

Find the point on the hyperbola $xy = 8$ that is closest to the point $(3, 0)$.