

Math 121**Quiz 9**

Justify all answers with neat and organized work. Clearly indicate your answers.
10 points possible.

1. (2 pts.) Express the function in the form $f(x) = (x - k)q(x) + r$ for the given value of k . (In other words, write the “check equation” that comes from dividing $f(x)$ by $x - k$.)

$$f(x) = x^3 + 3x^2 - 7x + 6, \quad k = 2$$

2. (3 pts.) Use synthetic division to show that x is a solution of the third-degree polynomial equation, and use the result to factor the polynomial completely. List all the real zeros of the function (i.e., real solutions to the equation).

$$3x^3 + 11x^2 - 19x + 5 = 0, \quad x = 1$$

3. (2 pts.) Find the focus of this parabola.

$$x^2 + 12y = 0$$

4. (3 pts.) Find the vertices of this hyperbola and sketch its graph, using asymptotes as sketching aids.

$$\frac{y^2}{9} - \frac{x^2}{16} = 1$$