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**Advanced Algebra II – Assignment 4-5**

9-20 Find the roots (the solutions when y=0) of each of the following polynomial functions.

 a. y = x2 - 6x + 8 b. f(x) = x2 - 6x + 9

 c. y = x3 – 4x

9-21 Sketch the graph of y = x2 – 7

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1. How many roots does this graph have?
2. What are the roots?

9-22 Solve x2 + 2x – 5 = 0

1. How many x-intercepts does y = x2 + 2x – 5 have?
2. Approximately where does the graph of y = x2 + 2x – 5 cross the x-axis?

9-67 In the 1500’s, and Italian mathematician named Rafael Bombelli invented the imaginary number , which is now called *i*. = *i* implies that *i2 = -1.* After this invention, it became possible to find solutions for x2 + 1 = 0; they are *i* and –*i*. What would be the value of  Use the definition of *I* to rewrite each of the following expressions.

a.  b. (2*i*)(3*i*) c. (2*i*)*2*(-5*i*) d. 

9-68 Graph the function y = x2 - 4x + 5.

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1. Does the graph cross the x-axis?
2. Use the quadratic formula to solve x2 - 4x + 5 = 0. Use your new understanding of imaginary numbers to simplify your results as much as possible.
3. Check one of the solutions to x2 - 4x + 5 = 0 by substituting it into the equation for x and simplifying the result.

9-72 Write each of the following expressions in the form *a* + *bi*.

 a. -18 -  b. 

1. 5 + 

9-73 Explain why *i3* = -*i*. What does *i*4 equal?

9-74 If f(x) = x2 + 7x -9, calculate the values in parts (a) through (c) below.

 a. f(-3) b. f(*i*) c. f(-3+*i*)