**1.** **Solve by applying the Quadratic Formula; all radicals should be simplified as far as possible. Show your work.**  
  
x2 + 4x + 13 = 0

**2. 2.** **Use the discriminant to determine whether the following equations have solutions that are: two different rational solutions; two different irrational solutions; exactly one rational solution; or two different imaginary solutions.**  
  
x2 + 10x + 19 = 0

a. Two different imaginary solutions

b. Two different rational solutions

c. Two different irrational solutions

d. Exactly one rational solution

3.  Use the quadratic formula to determine the x-intercepts (if any) of the following function. Then evaluate the function for several values of x, and use the resulting points to graph the function. Please show your work.  
  
f(x) = 3x2

**4. Without graphing, find the vertex.**

**F (x)= 5 + 19**

a.

d.

5. Without graphing, find the line of symmetry

F (x) = 8

x = 17

y = 17

x =

x = -

**6.** **Without graphing, find the maximum value.**  
  
f(x) = -(x + 1)2 – 8

1

2

0

-8

**7.** **Find the x- and y-intercepts. If no x-intercepts exist, state so.**  
  
f(x) = x2 + 13x

X - intercepts (0, -13) and (-13, 0); y-intercept (0,0)

X- intercepts (0, 0) and (-13, 0); y-intercept (0,0)

X-intercepts (0, 0) and (13, 0); y-intercept (0,0)

No x-intercept; y-intercept (0,0)

8. **Answer the following question. You will need to use the formula 4.9t2 + v0t = s, where t is the time in seconds, v0 is the initial velocity, and s is the distance in meters.**  
  
A rock is dropped from a helicopter at an altitude of 227 meters (s). Approximately how long does it take for the rock to reach the ground?

9. **9.** **Translate the problem into a pair of linear equations in two variables. Solve the equations using either elimination or substitution. State your answer for the specified variable.**  
  
A child's bank contains $2.24 in pennies and nickels. If the number of pennies is 40 less than 3 times the number of nickels, then how many pennies are in the bank?