Algebra I
U7L3 Practice

Name: KEY

1. Use the Quadratic Formula to find the solutions to the equations. If your answer is irrational, write your answer as a decimal rounded to the nearest hundredth.

   a. $3m+1=2m^2$ $-2m^2+3m+1=0$

   $x=\frac{-3\pm\sqrt{(3)^2-4(-2)(1)}}{2(-2)}$

   $=\frac{-3\pm\sqrt{17}}{-4}\approx\frac{-3\pm4.12}{-4}$ $x\approx -0.28$, $x\approx 1.78$

   b. $x^2+8x-6=0$ $x=\frac{-8\pm\sqrt{(8)^2-4(1)(-6)}}{2(1)}$

   $=\frac{-8\pm\sqrt{88}}{2}\approx\frac{-8\pm9.38}{2}$ $x\approx 0.69$, $x\approx -8.69$

   c. $7z-9z^2=-4$

   $-9z^2+7z+4=0$ $x=\frac{-7\pm\sqrt{(7)^2-4(-9)(4)}}{2(-9)}$

   $=\frac{-7\pm\sqrt{193}}{-18}\approx\frac{-7\pm13.89}{-18}$ $x\approx -0.38$, $x\approx 1.16$

2. Find the discriminant of each quadratic equation. Use the discriminant to determine the number of solutions. If there are two solutions, tell the type (rational or irrational). Then, use the Quadratic Formula to find the solutions (if there are any).

   a. $2x^2-4x-6=0$ $(-4)^2-4(2)(-6)=64$

   two rational solutions

   $x=\frac{-(-4)\pm\sqrt{64}}{2(2)}$

   $=\frac{4\pm8}{4}$

   $=x=3,\ x=-1$

b. $6x-9=x^2$

$-x^2+6x-9=0$

$(6)^2-4(-1)(-9)=0$

one solution

$x=\frac{-6\pm\sqrt{0}}{2(-1)}$

$=\frac{-6}{-3}$

$x=2$

c. $4x^2+5=-3x$

$4x^2+3x+5=0$

$(3)^2-4(4)(5)=-71$

no solution

3. Use the Free Falling Objects and Heights of Projectiles equations for the following problems.

a. A toy rocket launched into the air from the ground has an initial velocity of 96 ft/s. Write an equation to represent this situation.

$h(t)=-16t^2+96t$

Use your equation to find the time that the rocket will be on the ground.

$0=-16t^2+96t$

$0=-16t(t-6)$

$-16t=0$ $t=0$

$t-6=0$

$t=6$ secs

b. A rock is thrown at an initial velocity of 20 ft/s from a starting height of 5 feet. Write an equation to represent this situation.

$h(t)=-16t^2+20t+5$

Use your equation and the discriminant to determine if the rock will ever reach a height of 30 feet.

$30=-16t^2+20t+5$

$0=-16t^2+20t-25$

$(20)^2-4(-16)(-25)$

$=-1200$

no solution so no