Instructions: Complete the following problems. You may work alone or in a group. Do not just copy answers from a group member, but be sure that you understand the problem. Similar questions will appear on exams. You may be asked to explain or present the answers to the class. This assignment is due at the end of the class period.

1. Solve each equation by factoring and the zero-product property. For the problems labeled with a *, use your calculator to verify your answers.

   a. $*(n+3)(n-9)=0$ $n=-3, n=9$

   b. $(3p+1)(p-5)=0$ $p=-\frac{1}{3}, p=5$

   c. $*x^2-3x-4=0$ $(x-4)(x+1)=0$ $x=4, x=-1$

   d. $4x^2+2x=0$ $2x(2x+1)=0$ $x=0, x=-\frac{1}{2}$

   e. $n^2-n=6$ $n^2-n-6=0$ $(n-3)(n+2)=0$ $n=3, n=-2$

   f. $*1-5m=-4m^2$ $4m^2-5m+1=0$ $(4m-1)(m-1)=0$ $m=\frac{1}{4}, m=1$

   g. $*(x-2)(x-3)=56$ $x^2-5x+6=56$ $x^2-5x-50=0$ $(x-10)(x+5)=0$ $x=10$ $x=-5$

   h. $(c+2)^2=9$ $c^2+4c+4=9$ $c^2+4c-5=0$ $(c+5)(c-1)=0$ $c=-5, c=1$

   i. $2x^3+2x^2-12x=0$ $2x(x^2+x-6)=0$ $2x(x+3)(x-2)=0$ $x=0, x=-3, x=2$

   j. $*m^3+2m^2-9m-18=0$ $m^2(m+2)-9(m+2)=(m^2-9)(m+2)=(m+3)(m-3)(m+2)=0$ $m=3,-3,-2$

   k. $2a(a+1)=a^2+8$ $2a^2+2a=a^2+8$ $a^2+2a-8=0$ $(a+4)(a-2)=0$ $a=-4, a=2$

   l. $*y^2+5y=5(y+20)$ $y^2+5y=5y+100$ $y^2-100=0$ $(y-10)(y+10)=0$ $y=-10, y=10$

   m. $*(w-3)^2=9-2w$ $w^2-6w+9=9-2w$ $w^2-8w=0$ $w(w-8)=0$ $w=0, w=8$

   n. $8x^2+44x=24$ $4(2x^2+11x-6)=0$ $(2x-1)(x+6)=0$ $x=\frac{1}{2}, x=-6$

2. Find three consecutive odd integers such that the product of the second and third is 99.   7, 9, 11

3. The length and width of a rectangle are consecutive odd integers. Find the dimensions of the rectangle if the area is 255 square units. $n^2+2n-255=0$ $(n+17)(n-15)=0$ $n=15, n+2=17$

4. Write a polynomial with integer coefficients that has x=3 and x=5 as solutions.
   $(x-3)(x-5)=x^2-8x+15=0$

5. Write a polynomial with integer coefficients that has x=1, x=3 and x=7 as solutions.
   $(x-1)(x-3)(x-7)=0$
   $(x^2-4x+3)(x-7)=0$
   $x^3-7x^2-4x^2+28x+3x-21=0$
   $x^3-11x^2+31x-21=0$