Fall '05/MAT 150/Worksheet 2 **Name:** Solution *Show all your work.*

1. (3pts) Solve the equation: $3(x+2)+1=5x-4$

$3x+7=5x-4$

$11=2x$

$x=\frac{11}{2}$

2. (5pts) Solve for r: $A=P(1+rt)$ $\div P$

$\frac{A}{P}=1+rt$

$\frac{A}{P}-1=rt$

$r=\frac{\frac{A}{P}-1}{t}=\frac{A-P}{Pt}$

↑ mult. num. & denom. by P

3. (9pts) Solve the following equations, keeping in mind that solutions could be complex numbers:

a) $x^2-2x=x-13$

$x^2-3x+13=0$

$x=\frac{3\pm\sqrt{9-4\cdot1\cdot13}}{2}=\frac{3\pm\sqrt{9-52}}{2}=\frac{3\pm\sqrt{-43}}{2}=\frac{3\pm\sqrt{43}i}{2}$ no real solutions

b) $\frac{x+3}{2(x-3)}=\frac{x+6}{\underbrace{x^2-3x}_{x(x-3)}}$ $\cdot\, 2x(x-3)$

$(x+3)x=(x+6)2$

$x^2+3x=2x+12$

$x^2+x-12=0$

$(x+4)(x-3)=0$

$x=3,-4$

$x=-4$ is the solution since 3 produces a zero in denominator.

4. (7pts) Put the following expressions into standard form $a + bi$:

a) $5i(3+2i) - (7-3i) =$ $15i - 10 - 7 + 3i = -17 + 18i$

b) $\frac{1-2i}{4-i} =$ $\frac{1-2i}{4-i} \cdot \frac{4+i}{4+i} = \frac{4-7i-2i^2}{16+1} = \frac{6-7i}{17} = \frac{6}{17} - \frac{7}{17}i$

5. (6pts) The manager at a concert hall would like to know how many people bought tickets for the orchestra section and the balcony section. She knows that 430 people attended the concert, and that gross receipts were \$13,090. If orchestra tickets sell for \$35 and balcony tickets sell for \$25, how many people sat in each section?

x = no. of people seated in the orchestra section

$430 - x =$ _____ balcony _____

$35x + 25(430 - x) = 13,050$

$10x + 10,750 = 13,090$

$10x = 2340$

$x = 234$

234 sat in orchestra section

196 _____ balcony