Basic algebra quiz: Econ 4808 Fall 05

Each of the first five questions will be graded out of 2 points, so is question 6, but it is extra credit.

1. Factor the expression $a^{x+2} = a^x a^2$
2. Expand and simplify $\frac{a^4 b^{-3}}{(a^2 b^{-3})^2} = \frac{a^4 b^{-3}}{a^4 b^{-6}} = \frac{b^6}{b^3} = b^3$
3. Simplify the expression $(2t-1)(t^2-2t+1) = 2t^3 - 4t^2 + 2t - t^2 + 2t - 1 = 2t^3 - 5t^2 + 4t - 1$
4. $\frac{x+y}{x(x+1)} = \frac{(1+\frac{y}{x})}{x+1}$ is true or false? Prove it. It is true $\frac{x+y}{x(x+1)} = \frac{\frac{1}{x}(x+y)}{\frac{1}{x}x(x+1)} = \frac{(1+\frac{y}{x})}{x+1}$
5. What does $\frac{m+2}{m-1} < 0$ tell one about the value of m? $\frac{m+2}{m-1}$ will be negative if (a) $(m+2)$ is positive and $(m-1)$ is negative, or (b) if $(m+2)$ is negative and $(m-1)$ is positive. Condition a requires that $1 > m > -2$,and condition b requires that $1 < m < -2$. But this second inequality cannot be true: m cannot both be greater than 1 and less than -2. That is, $(m+2)$ negative and $(m-1)$ positive is impossible. So the answer is $1 > m > -2$. In words m is between one and negative two, not including 1 or negative 2.
6. My mother taught me that one should never date anyone that is less than half their age plus 7. Let A_o be the age of the older person and let A_y be the age of the younger person. Express this constraint algebraically. Then use this algebraic expression to determine at what age one can only date people of one's own age. $A_y \geq .5A_o + 7$. At what age will $A = .5A + 7$, Solution is: 14.0.