Lottery Decisions

Dr. Sarah's 1010: Introduction to Mathematics

goals:

- Explore applications of algebra in everyday life
- Develop problem solving and analysis skills to work towards becoming logical, flexible, critical thinkers and problem solvers who thoughtfully consider the reasonableness of their solutions
- Communicate algebraic information in written documents

1. A Powerball lottery from usatoday.com. said "For the jackpot worth 295 million, if there is one winner, then they will have a choice between 25 annual payments of 11.8 million each (Note that 25*11.8 =295) or a single lump sum payment of 170 million." How can we compare the logical benefits and reasonableness of each choice? Let's cut off the "million" to make it easier to work with (if you look at the formulas for lump sum and periodic payment, this is ok to do to adjust the units, since it is multiplication outside the parenthesis).
   (a) For comparison sake, set up the equation, with numbers filled in, that represents the total savings plus interest if we took the lump sum and leave the 170 in an account at 5% compounded annually for the 25 years.

   (b) Solve for the total (in millions)
   (c) What is the interest (in millions)? Show work.
   (d) Set up the equation that represents the total savings plus interest, in millions, if we took the annual payment and deposit each 11.8 annual payment into the same type of account at 5% compounded annually for the 25 years.

   (e) Solve for the total (in millions)
   (f) What is the interest (in millions)? Show work.
   (g) Which yields more money? Circle one: lump periodic
   (h) Which yields more interest? Circle one: lump periodic
   (i) Do these make sense? If so, write yes. If not, explain why not.

   (j) Which would you select?

2. Set up but do not solve: Different lottery: Let's say we take a periodic payment option and the lottery will pay us each month. What if we want to spend much of our winnings—write the equation that represents how much (in millions) we would need to deposit per month to obtain 1 million in 25 years, say at 1.5% compounded monthly.

3. Set up but do not solve: Let's say we plan to save 2000 dollars per month and spend the rest of our winnings. Write the equation that represents how long (in years or months—whichever you prefer) it will take the savings account to reach 1,000,000 dollars, at 1.5% compounded monthly.

4. Search for recent news on: **lottery winner lump** and report back, giving a source.