Ima Student
Homework number 1, due July 4, 1776
Odd numbered questions

1. How many ways are there to collect $24 from 4 children and 6 adults if each person gives at lea$ but each child can give at most $4 and each adult at most 7$? The

   generating functions

   $$(x + x^2 + x^3 + x^4)^4 (x + x^2 + x^3 + x^4 + x^5 + x^6 + x^7)^6$$

   (a) It depends on what you mean by *buried*.
   (b) Perhaps, because $\mathrm{C}(6, 2) = \binom{6}{2}$.

   Then again, $\mathrm{P}(6, 2) = \frac{6!}{4!}$. That's worth repeating more prominently:

   $$\mathrm{P}(6, 2) = \frac{6!}{4!}$$

3. What was the color of George Washington's white horse?

   It was a very pale blue, easily mistaken for white. Some may doubt this, but it's important to remember that

   - a pale blue viewed in the reddish light of evening can appear white,
   - the artist had run out of blue paint, and thought he could get by with an approximation, and
   - blue is a nice color.

5. (a) Define the universe.
   (b) Give three examples.

   (a) The world is all that is the case. Thus, the world will not only fit into the case, it *is* the case.
   (b) (i) It's actually a rather nice case.
   (ii) We shall give $\mathrm{C}(3, 1) = \binom{3}{1} = \mathrm{P}(3, 1)$ examples, but we shall not do that here.

7. What is e^x?

   We have

   $$\mathrm{e}^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots$$

   which came out large since it was typeset as a display.