1. 9 bits are only needed to give 400 students a unique bit patter, and 111 students can have more unique patterns without adding bits.

2. 680 to binary is: 001010101000
   to octal is: 1250
   to hexadecimal is: 2A8

3. 1311365115

4. a unsigned binary 255
   2's complement -1
   1's complement -0

5. a 0100101111010010
   b1011010000101110
   c B42E

6. a 6133
   b a3

7. a $-1.101x2^2$
   b 9/32 = 0.28125

8. $1.01101011x2^2$

9. a 0 1000 0001 01101011
   b 0816B

10 a. It is impossible to represent because the mantissa is 23 bits while the binary is 25 bits long.
   b. 11.00000 00000 00000 00000 0
   c. 11.00000 00000 00000 00000 1

11 The first addition does not cause truncation, the second addition does cause truncation of a 0 so it does not cause any problems

12. The first addition does cause truncation of the last one so the number does not change and the second addition repeats the same truncation as the first addition.