**Answer to Self-Assessment problem 6**

46.5 decimal = 101110.1 = 1.011101 x 2101

The first line converts a decimal number into a binary number, and then into a binary fraction times 2 raised to the binary 101 (decimal 5) power. The binary fraction is left-justified so that the most significant 1 is just to the left of the binary point. The power of two is determined by counting the five spaces the binary point is moved to the left. The floating-point exponent is 0111 1111 + 101 = 1 000 0100.

1.011101 x 2101 then converts to:

| **Sign-Bit**  0 | **Exponent**  1 000 0100 | **Significand**  0111 0100 0000 0000 0000 000 |
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