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Quiz #3

#1.

Assume for the contradiction that $6 – 7\sqrt{2}$ is rational. This gives us $6-7\sqrt{2} = a/b$. $\sqrt{2} = 6/7 – a/7b$. This shows $\sqrt{2}$ equals the difference of two rational numbers, therefore proving the contradiction that the equation is rational.

#2.

Suppose for the contradiction that a AND b are rational, and ab is irrational. Using integers c, d, e, and f, with d != 0 and f !=0, we can see a = c/d and b = e/f. Then, ab = ce/df. With ce/df being integers, this proves that ab is rational, which contradicts the original statement saying if ab is irrational, then b is irrational.

#3.

If we use 1 in A's equation, we get 18(1) – 2 = 16. Since A proclaims to be a subset of B, we plug 16 into B's equation, such that 18b +16 = 16. This becomes 18b = 0 and 0/18 is not an integer, therefore making 16 not an element of B. In result, A is **not** a subset of B.

#8.

{{}, {-3}, {0}, {-3,0}}

#9.

[{2}, {2,1,1}, {2,2,2}, {1,1} {1,2}, {2,1}, {2,2}]