Algebra 1
Chapter 15 Summary and Review
Number 6e

Start by writing out the original problem

$1/a - b/x = b$

Now, with any fractions, in order to be able to do something with them algebraically, we have to get a common denominator. These fractions are no different. Whenever it is not readily apparent what number would make a good common denominator, we can multiply the existing denominators and that product will function as a perfectly acceptable common denominator. In this case, we multiply a times x to get "ax" as the common denominator.

Now, in order to arrive at that common denominator, here are some steps you can do:

$1/a(x/x) - b/x(a/a) = b$

What we've done is multiply each fraction by 1. Now because we expressed "1" as a fraction with variables, we end up with:

$X/ax - ab/ax = b$

We have not changed the value of the fractions, only their format. So we have not violated any algebra rules, we've only made our lives a little easier because now we are able to simplify using that common denominator.

$$\frac{X - ab}{Ax} = b$$

Multiply both sides by 'ax"

$$(ax)\frac{X - ab}{} = b(ax)$$

Ax

X – ab = b(ax)

X – ab = abx

Then we add "ab" to both sides to get x by itself.

X = abx + ab

Notice, though, that we aren't finished at this step because we still have an "x" term over there on the right. So we have to also move that guy around so that we end up with ONLY x terms on one side of the equation and everything else on the other.
So we subtract abx from both sides.

X – abx = ab

Now that we have all the x's on the left side, we notice that we can factor out an "x" from the terms on the left since "x" is the greatest common factor between "x" and "abx"

X(1 – ab) = ab

Now that we have isolated x on the left side, we can get x by itself by dividing both sides by " 1- ab"

So we perform that division:

$$X = \frac{ab}{1 - ab}$$

Since this fraction cannot be simplified any further, we are done.