1 *Solve the equation*

$$\frac{2k-1}{4} = 2.$$

(Show at least one intermediate step.)

To make things easier, I'll clear fractions by mutlitplying both sides by 4:

$$2k - 1 = 8.$$

Then I add 1 to both sides:

$$2k = 9.$$

Finally, I divide both sides by 2:

$$k = \frac{9}{2}.$$

2 *One of these equations is an identity, while the other is a contradiction. Identify which is which. (Show at least one complete step for each of these.)*

a $\dfrac{4x-9}{6} - \dfrac{x}{2} = \dfrac{x}{6} + 3$

I multiply both sides by 6 to clear fractions:

$$4x - 9 - 3x = x + 18.$$

Then I simplify each side:

$$x - 9 = x + 18.$$

Next, I subtract x from both sides:

$$-9 = 18.$$

At this point, the variable is gone, and the equation is simply false. Therefore, this equation is a **contradiction**.

b $6q - (q-3) = 2q + 3(q+1)$

First, I simplify each side:

$$5q + 3 = 5q + 3.$$

Since the two sides are now the same, this equation is an **identity**.