**1** *Solve the equation*

$$x(x-1)=6.$$

*(Show at least* two *intermediate steps.)*

I expand the left-hand side, make the right-hand side zero, and factor:

$$\begin{aligned} x(x-1)&=6;\\ x^2-x&=6;\\ x^2-x-6&=0;\\ (x-3)(x+2)&=0;\\ x-3=0 \text{ or } x+2&=0;\\ x=3 \text{ or } x&=-2. \end{aligned}$$

If you like, the solution set for $x$ is $\{-2,3\}$.

**2** *Solve the inequality*

$$-3\le\frac{3x-4}{2}\le 6$$

*in the real number system. (Show at least* two *intermediate steps.)*

There are three sides, and I must do the same operations to all of them:

$$\begin{aligned} -3\le\frac{3x-4}{2}&\le 6;\\ -6\le 3x-4&\le 12;\\ -2\le 3x&\le 16;\\ -\frac{2}{3}\le x&\le\frac{16}{3}. \end{aligned}$$

If you like, the solution set for $x$ is $[-2/3,16/3]$.

**3** *Solve the equation*

$$4x^2-4x+5=0$$

*in the complex number system. (Show at least enough work that I can tell which method —completing the square, quadratic formula, etc— you used.)*

I'll use the quadratic formula, with $a=4$, $b=-4$, and $c=5$. Then

$$x=\frac{-(-4)\pm\sqrt{(-4)^2-4(4)(5)}}{2(4)}=\frac{4\pm\sqrt{-64}}{8}=\frac{4\pm 8\mathrm{i}}{8}=\frac{1}{2}\pm\mathrm{i}.$$

If you like, the solution set for $x$ is $\{1/2+\mathrm{i},1/2-\mathrm{i}\}$.