1 *Solve the equation*

$$\frac{2x}{3} - \frac{x}{2} = \frac{5}{12}.$$

(Show at least one intermediate step.)

To begin with, I multiply both sides by 12 (a common denominator); after that, it's pretty straightforward.

$$\frac{2x}{3} - \frac{x}{2} = \frac{5}{12};$$
$$8x - 6x = 5;$$
$$2x = 5;$$
$$x = \frac{5}{2}.$$

If you want the solution set, that's $\{5/2\}$.

2 *Solve the inequality*

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

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

To begin with, I multiply *all three sides* by 2, then add 4, then finally divide by 3. Since 2 and 3 (the numbers that I'm multiplying and dividing by) are positive, I keep the inequalities in the same direction.

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

If you want the solution set in interval notation, that's $[-2/3, 16/3]$.

3 *Solve the equation*

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

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

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

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

If you want the solution set, that's $\{1/2 + i, 1/2 - i\}$.