

Solving Systems - By Substitution

- I. To solve a system of equations by substitution, first **isolate one of the variables in the system**. For example, in the system below, we can isolate the r in the second equation by adding $6s$ to both sides:

$$\begin{array}{l} 3r - 8s = 19 \\ r - 6s = 3 \longrightarrow r = \textcircled{3 + 6s} \end{array}$$

- II. Since $r = 3 + 6s$, we can now substitute a $3 + 6s$ in for the r in the first equation.

$$\begin{array}{l} 3r - 8s = 19 \\ r - 6s = 3 \longrightarrow r = \textcircled{3 + 6s} \end{array}$$


- III. Our first equation becomes:

$$3(3 + 6s) - 8s = 19$$

- IV. We can now solve for s , which equals 1. To find r , plug 1 back in for s **in the equation where r has been isolated** ($r = 3 + 6s$). This will make it easier to find that $r = 9$.
- V. Always use **parentheses** when substituting.