Find a line perpendicular to x–6y=2, and passing through the point (2,4) .

1) Perpendicular lines have slopes that are negative reciprocals. This means we solve for the slope in x–6y=2, and then form the negative reciprocal.

$x-6y=2$ .... Original equation

$-6y=-2-x$ .... x moved to the right with subtraction

$y=\dfrac{-2}{-6} - \dfrac{x}{-6}$ .... Divide both sides by -6

$y=\dfrac{1}{3} + \dfrac{1}{6}x$ .... $\dfrac{-2}{-6} = \dfrac{-2\cdot 1}{-2\cdot 3}=\dfrac{1}{3}$ and rewrite $\dfrac{-x}{-6}$ as $\dfrac{x}{6} = \dfrac{1}{6}x$

2) Now form the negative reciprocal of $\dfrac{1}{6}$ as $\dfrac{-6}{1}=-6$

3) Now use the point slope formula to find the equation of the perpendicular line.

Formula: $y - y_0 = m(x - x_0)$

Identify m as -6, $x_0 = 2$ and $y_0 = 4$. Plug these into the formula.

$y-4=-6(x-2)$ .... Setup the equation
$y-4=-6x+12$ .... Distribute the -6
$y=-6x+12+4$ .... Move the 4 to the right with addition.
$y=-6x+16$ .... Simplify