Samples **Equation of a straight line SOLUTIONS**

1. To find the equation of the new line, we first need the gradient of the original line. Now,

$$\begin{aligned} 50 &= -5y - 5x, \text{ so} \\ 5y &= -5x - 50 \\ y &= -x - 10 \end{aligned}$$

Hence, the gradient of the original line is $m = -1$.
The new line is parallel to the original line, so it has the same gradient as the original line. Thus the equation of the line is $y = -x + c$ and we can substitute the coordinates of the point $(x_1, y_1) = (3, -1)$ into this equation to get the value for c.
$-1 = -1 \times 3 + c$, so $-1 = -3 + c$. Hence $c = -1 - (-3) = 2$.
Hence the equation of the line is $y = -x + 2$.

2. To find the equation of the new line, we first need the gradient of the original line. Now,

$$\begin{aligned} -7y + 7x &= 0, \text{ so} \\ -7y &= -7x \\ y &= x \end{aligned}$$

Hence, the gradient of the original line is $m = 1$.
The new line is parallel to the original line, so it has the same gradient as the original line. Thus the equation of the line is $y = x + c$ and we can substitute the coordinates of the point $(x_1, y_1) = (-6, -5)$ into this equation to get the value for c.
$-5 = 1 \times (-6) + c$, so $-5 = -6 + c$. Hence $c = -5 - (-6) = 1$.
Hence the equation of the line is $y = x + 1$.

3. To find the equation of the new line, we first need the gradient of the original line. Now,

$$\begin{aligned} -8 &= 2x - 2y, \text{ so} \\ 2y &= 2x + 8 \\ y &= x + 4 \end{aligned}$$

Hence, the gradient of the original line is $m = 1$.
The new line is parallel to the original line, so it has the same gradient as the original line. Thus the equation of the line is $y = x + c$ and we can substitute the coordinates of the point $(x_1, y_1) = (-5, -3)$ into this equation to get the value for c.
$-3 = 1 \times (-5) + c$, so $-3 = -5 + c$. Hence $c = -3 - (-5) = 2$.
Hence the equation of the line is $y = x + 2$.