1. Find the equation of the line with a $y$-intercept of $\frac{1}{3}$ that is parallel to the line $5x - 2y = \frac{1}{8}$. Write the equation in slope-intercept form (if possible).

Start by finding the slope of the equation that is given by converting it to slope-intercept form ($y = mx + b$) by isolating the $y$ variable.

\[
5x - 2y = \frac{1}{8}
\]

\[
-2y = -5x + \frac{1}{8}
\]

\[
y = \frac{-5}{-2}x + \frac{1}{-8}
\]

\[
y = \frac{5}{2}x - \frac{1}{16}
\]

Now that the given equation is in slope-intercept form, I can see that the slope of the given line is $\frac{5}{2}$ (the coefficient of $x$). In order for the equation of the line I am looking for to be parallel to the line that is given, the slopes must be the same. So the equation of the line that I am trying to find must also have a slope of $\frac{5}{2}$. And since the equation of the line I am finding also has a $y$-intercept of $\frac{1}{3}$, it is passing through the point $\left(0, \frac{1}{3}\right)$. 
So using point-slope form \((y - y_1 = m(x - x_1))\) I can find the equation of the line.

\[
y - y_1 = m(x - x_1)
\]

\[
y - \frac{1}{3} = \frac{5}{2}(x - 0)
\]

\[
y - \frac{1}{3} = \frac{5}{2}x - 0
\]

\[
y = \frac{5}{2}x + \frac{1}{3}
\]
2. Find the equation of the line with an x-intercept of $-3$ and perpendicular to the line $y = \frac{2}{3}x + 5$. Write the equation in slope-intercept form (if possible).

Start by finding the slope of the equation that is given. Since the given line is already in slope-intercept form ($y = mx + b$), the slope is simply the coefficient of $x \left( m = \frac{2}{3} \right)$.

In order for the equation of the line I am looking for to be perpendicular to the line that is given, the slopes must be the negative reciprocal of one another. So the equation of the line that I am trying to find must have a slope of $-\frac{3}{2}$. And since the equation of the line I am finding has an x-intercept of $-3$, it is passing through the point $(-3, 0)$. So using point-slope form ($y - y_1 = m(x - x_1)$) I can find the equation of the line.

$y - y_1 = m(x - x_1)$

$y - 0 = -\frac{3}{2}(x - (-3))$

$y = -\frac{3}{2}(x + 3)$

$y = -\frac{3}{2}x - \frac{9}{2}$