Straight Lines Homework

1) Draw axes on the squares in your book that run from -10 to +10 on both the $x$ and $y$ axes.
Use tables of values to accurately plot the following 3 lines on the same diagram
a) $L_{1} \quad y=2 x+3$

| $x$ | -5 | 0 | 3 |
| :--- | :--- | :--- | :--- |
| $y$ | -7 | 3 | 9 |

b) $L_{2} \quad y=-x+6$
$x-4 \quad 0 \quad 6$
c) $L_{3} \quad y=\frac{1}{2} x-6$

| $x$ | -4 | 0 | 6 |
| :---: | :---: | :---: | :---: |
| $y$ | 10 | 6 | 0 |

$\begin{array}{cccc}x & -4 & 0 & 10 \\ y & -8 & -6 & -1\end{array}$
Write down the coordinates of the points of intersection of
d) $L_{1}$ and $L_{2}(1,5)$
e) $L_{1}$ and $L_{3}(-6,-9)$
f) $L_{2}$ and $L_{3}(8,-2)$
1)

2) Find the equation of a line parallel to $y=3 x-5$ which passes through $(4,2)$

$$
m_{1}=3 \Rightarrow m_{2}=3 \text { since parallel }
$$

Line of form $y=3 x+c$
$\operatorname{Sub}(4,7)$

$$
\begin{aligned}
7 & =3(4)+c \\
7 & =12+c \\
7-12 & =c \\
-5 & =c \\
y=3 x-5 &
\end{aligned}
$$

3) Find the equation of a line perpendicular to $y=\frac{1}{2} x+4$ which passes through $(2,-3)$

$$
m_{1}=\frac{1}{2} \Rightarrow m_{2}=-\frac{2}{1}=-2
$$

since perpendicular
Line of form $y=-2 x+c$
$\operatorname{Sub}(2,-3)$

$$
\begin{aligned}
-3 & =-2(2)+c \\
-3 & =-4+c \\
-3+4 & =c \\
+1 & =c
\end{aligned}
$$

$$
y=-2 x+1
$$

4) Find the equation of a line which passes through $(2,-3)$ and $(5,9)$

$$
\begin{aligned}
\text { gradient } m & =\frac{y_{2}-y_{1}}{x_{2}-x_{1}} \\
m & =\frac{9--3}{5-2}=\frac{9+3}{3}=\frac{12}{3}=4
\end{aligned}
$$

Line of form $y=4 x+c$
$\operatorname{Sub}(5,9)$

$$
\begin{aligned}
& 9=4(5)+c \\
& 9=20+c \\
& 9-20=c \\
&-11=c \\
& y=4 x-11
\end{aligned}
$$

