I linear functions.

$$
y=m x+b
$$

Given: $\left(x_{1}, y_{1}\right),\left(x_{2}, y_{2}\right)$

$$
\text { slope: } \frac{y_{2}-y_{1}}{x_{2}-x_{1}}=m
$$

$y$-int: $b$
(when $x=0$ )

$$
\begin{aligned}
& \begin{array}{l}
\text { line } l \text { passes } \\
(1,5) \text { and }(3,1) \\
\text { Find an eq. of } l \\
m=\frac{5-1}{1-3}=\frac{4}{-2}=-2
\end{array}\left\{\begin{array}{l}
y=-2 x+b \\
1=-2(3)+b \\
1=-6+b \\
7=b \\
y=-2 x+7
\end{array}\right.
\end{aligned}
$$

Line $k$ passes $(-2,1)$ and (4, 4).
Find an equation of $k$.

$$
\begin{aligned}
& m=\frac{4-1}{4-(-2)}=\frac{3}{6}=\frac{1}{2} \\
& \left.\begin{array}{l}
y=\frac{1}{2} x+b \\
4=\frac{1}{2}(4)+b \\
4=2+b \\
2=b
\end{array}\right\} y=\frac{1}{2} x+2
\end{aligned}
$$

line $n$ passes

$$
(1,-1) \text { and }(3,5)
$$

Find an eq. of $n$.

$$
\begin{aligned}
& \frac{5-(-1)}{3-1}=\frac{6}{2}=3=m \\
& y=3 x+b \\
& 5=3(3)+b \\
& -9-9 \quad b=-4
\end{aligned}
$$

line $A$ pass $(-1,3)$
$w 1$ th $y$-int of $1 \rightarrow(0,1)$
Find an eq. of $A$.

$$
\left.\begin{array}{l}
y=m x+1 \\
3=m(-1)+1 \\
3=-m+1 \\
2=-m \rightarrow m=-2
\end{array}\right\} y=-2 x+1
$$

soowookLee. weebly. com

