SOLUTIONS $\Rightarrow$ ORDINATE GEOMETRY REVIEW \# 2
(a)

$$
\begin{aligned}
& \text { Point } \Rightarrow(-5,1) \\
& \text { Slope } \Rightarrow \frac{1}{2} \\
& \text { Equation } \Rightarrow y-y_{1}=m\left(x-x_{1}\right) \\
& y-1
\end{aligned}=\frac{1}{2}(x-5) \quad \begin{aligned}
& y-1=\frac{1}{2}(x+5) \\
& x^{2}-x^{2}=\frac{1}{2} x+\frac{5}{2} \\
& y-2 \\
& 2 y-2=1 x+5 \\
& 0=1 x-2 y+2+5 \\
& 0=1 x-2 y+7
\end{aligned}
$$

b) Point $\Rightarrow(-6,2)$ or $(5,-3)$

$$
\text { Slope } \Rightarrow \begin{aligned}
m & =\frac{y_{2}-y_{1}}{x_{2}-x_{1}} \\
& =\frac{-3-2}{5-6} \\
& =\frac{-5}{11}
\end{aligned}
$$

Equation $\Rightarrow$

$$
\begin{gathered}
n \Rightarrow \quad y-y_{1}=m\left(x-x_{1}\right) \\
y-2=-5(x-6) \\
x^{\prime \prime} x^{\prime \prime \prime}=-5 x^{\prime \prime}-30^{x 11} \\
y^{-1}=-\frac{11}{11}-11 \\
11 y-22=-5 x-30 \\
5 x+11 y-22+30=0 \\
5 x+11 y+8=0
\end{gathered}
$$

d) Point $\Rightarrow(1,6)$

Slope $\Rightarrow$ Parallel to $3 x+y=4$

$$
\begin{aligned}
& y=-3 x+4 \\
& (y=-3
\end{aligned}
$$

$$
\begin{aligned}
\text { Equation } \Rightarrow y-y_{1} & =m\left(x-x_{1}\right) \\
y-6 & =-3(x-1) \\
y-6 & =-3 x+3 \\
3 x+y-6-3 & =0 \\
3 x+y-9 & =0
\end{aligned}
$$

d) Point $\Rightarrow(-5,0)$

Slope $\Rightarrow$ Perpendicular to $-2 x-y+3=0$ $-2 x+3=y$

$$
m=-2
$$

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

Equation $\Rightarrow$

$$
\begin{aligned}
y-y_{1} & =m\left(x-x_{1}\right) \\
y-b & =\frac{1}{2}(x-5) \\
y & =\frac{1}{2}(x+5) \\
y^{x^{2}} & =\frac{1}{2} x^{2}+\frac{5^{x 2}}{2} \\
2 y & =1 x+5 \\
0 & =1 x-2 y+5
\end{aligned}
$$

e)

$$
\begin{aligned}
& \begin{aligned}
\text { Point } \Rightarrow & x \text {-int of } 4 ; \quad \text { Y-int of }-3 \\
& *(4,0) \quad \text { OR }(0,-3)
\end{aligned} \\
& \text { Slope } \Rightarrow m=\frac{y_{2}-y_{1}}{x_{2}-x_{1}} \\
& =\frac{-3-0}{0-4} \\
& =\frac{-3}{-4} \\
& =\frac{3}{4} \\
& \text { Equation } \Rightarrow y-y_{1}=m\left(x-x_{1}\right) \\
& y-6=\frac{3}{4}(x-4) \\
& y^{x^{4}}=\frac{3}{4} x-\frac{12^{x^{4}}}{4} \\
& 4 y=3 x-12 \\
& 0=3 x-4 y-12
\end{aligned}
$$

f) Point $\Rightarrow \underset{(5,0)}{x-i n t}$ of 5

Slope $=>2$

$$
\begin{aligned}
\text { Equation } \Rightarrow y-y_{0} & =m\left(x-x_{1}\right) \\
y-0 & =2(x-5) \\
y & =2 x-10 \\
0 & =2 x-y-10
\end{aligned}
$$

g)

$$
\begin{aligned}
& \text { Point } \Rightarrow \begin{aligned}
y \text {-int of } 2 \\
(0,2)
\end{aligned} \\
& \text { Slope } \Rightarrow \frac{1}{2} \\
& \text { Equation } \Rightarrow \begin{aligned}
y-y_{1} & =m\left(x-x_{1}\right) \\
y-2 & =\frac{1}{2}(x-0) \\
y^{x_{2}}-2^{x^{2}} & =\frac{1}{2} x \\
2 y-4 & =1 x \\
0 & =1 x-2 y+4
\end{aligned}
\end{aligned}
$$

2. $P(-2,-5) Q(-1,6) R(5,-6)$
a) Right Bisector for $P Q$ :
(1) Midpoint of $P Q$

$$
\begin{aligned}
M_{P Q} & =\left(\frac{x_{2}+x_{1}}{2}, \frac{y_{2}+y_{1}}{2}\right) \\
& =\left(\frac{-1+-2}{2}, \frac{6+-5}{2}\right) \\
& =\left(\frac{-3}{2}, \frac{1}{2}\right) \longleftarrow P O I N T
\end{aligned}
$$

(2) Perpendicular slope of $P Q$

$$
\begin{aligned}
m_{P Q} & =\frac{y_{2}-y_{1}}{x_{2}-x_{1}} \quad m_{\perp}=\frac{-1}{11} \triangle \text { SLOPE } \\
& =\frac{6--5}{-1--2} \\
& =\frac{11}{1} \\
& =11
\end{aligned}
$$

(3) EQUATIIN

$$
\begin{aligned}
& y-y_{1}=m\left(x-x_{1}\right) \\
& y-\frac{1}{2}=-\frac{1}{11}\left(x-\frac{3}{2}\right) \\
& y-\frac{1}{2}=-\frac{1}{11}\left(x+\frac{3}{2}\right) \\
& y^{x^{22}}-\frac{1}{2}=\frac{x^{x^{2}}}{11} x-\frac{3^{* 22}}{22} \\
& 22 y-11=-2 x-3 \\
& 2 x+22 y-21+3=0 \\
& 2 x+22 y-8=0
\end{aligned}
$$

b) Altitude from vertex $R$ :
(1) PoIn $\tau \Rightarrow R(5,-6)$
(2) Perpendicular slope of $P Q$

$$
\begin{aligned}
m_{P Q} & =\frac{y_{2}-y_{1}}{x_{2}-x_{1}} \quad m_{\perp}=\frac{-1}{11} \&-\text { SLOPE } \\
& =\frac{6-5}{-1-2} \\
& =\frac{11}{1} \\
& =11
\end{aligned}
$$

(3) EQUATITON

$$
\begin{aligned}
& y=y_{1}=m\left(x-x_{1}\right) \\
& y=-6=-1(x-5) \\
& y^{11}+6=-1111 x^{x 11}+\frac{5^{x 11}}{11} \\
& 11 y+66=-11 x+5 \quad|x+11 y+6|=0
\end{aligned}
$$

C) Median from vertex $Q$ :
(1) Midpoint of PR

$$
\begin{aligned}
M_{P R} & =\left(\frac{x_{2}+x_{1}}{2}, \frac{y_{2}+y_{1}}{2}\right) \\
& =\left(\frac{5+-2}{2},-\frac{6+5}{2}\right) \\
M & =\left(\frac{3}{2}, \frac{-11}{2}\right)
\end{aligned}
$$

(2) SLOPE of $Q M$

$$
m_{Q M}=\frac{y_{2}-y_{1}}{x_{2}-x_{1}}
$$

$$
=\frac{6^{2}-\frac{\hat{11}_{2}^{1}}{-1-\frac{3}{2}}}{-1}
$$

$$
=\frac{\frac{6}{1}+\frac{11}{2}}{-\frac{1}{1}-\frac{3}{2}}
$$

$$
=\frac{\frac{12}{2}+\frac{11}{2}}{\frac{-2}{2}-\frac{3}{2}}
$$

$$
=\frac{\frac{23}{2}}{\frac{-5}{2}}
$$

$$
=\frac{23}{2} \times \frac{2}{-5}
$$

$$
=\frac{46}{-10}
$$

$$
=-\frac{23}{5} \triangle S L O P E
$$

(3) EQUATION $\left[\operatorname{POIN} T \Rightarrow(-1,6) \underline{\text { OR }}\left(\frac{3}{2},-\frac{11}{2}\right)\right]$

$$
\begin{gathered}
y-y_{1}=m\left(x-x_{1}\right) \\
y-6=-\frac{23}{5}(x-1) \\
y-6=-\frac{23}{5}(x+1) \\
y^{x 5}-6^{x 5}=-\frac{23}{5} x^{x 5}-\frac{23}{5} \\
5 y-30=-23 x-23 \\
23 x+5 y-30+23=0 \\
23 x+5 y-7=0
\end{gathered}
$$

3. Solve by graphing:

$$
\text { (1) } x+y=4
$$

$$
y=-x+4
$$

$$
m=-\frac{1}{1}(\text { down })
$$

$$
b=4
$$

$$
\begin{aligned}
& x+y=4(1) \\
& x-2 y=10 \\
& \text { (2) } x-2 y=10 \\
& \frac{x}{2}-\frac{10}{2}=2 y \\
& \frac{x}{2}-5=y \\
& m=\frac{1}{2} \text { (up) (over) } \\
& b=-5
\end{aligned}
$$


4.

$$
\begin{aligned}
3 x+y & =2^{(1)} \\
2 x+5 y & =23 \\
\text { (1) } 3 x+y & =2 \\
y & =-3 x+2 \text { sub in(2) }
\end{aligned}
$$

(2)

$$
\begin{aligned}
& 2 x+5 y=23 \\
& 2 x+5(-3 x+2)=23 \\
& 2 x-15 x+10=23 \\
&-13 x=23-10 \\
&-13 x=13 \\
&-13-13 \\
& x=-1 \text { subin(1) }
\end{aligned}
$$

(1)

$$
\begin{aligned}
3 x+y & =2 \\
3(-1)+y & =2 \\
-3+y & =2 \\
y & =2+3 \\
y & =5
\end{aligned}
$$

SOLUTION: $(-1,5)$

$$
\begin{aligned}
& \begin{array}{l}
2 x+5 y=19 \text { (1) } \\
3 x-y=3
\end{array} \\
& 3 x-y=3^{(2)} \\
& 5 x \text { (2) } 15 x-5 y=15 \text { (3) } \\
& \text { (1) }+ \text { (3) } \frac{17 x}{17}=\frac{34}{17} \\
& x=2 \text { sub in(2) }
\end{aligned}
$$

(2)

$$
\begin{gathered}
3 x-y=3 \\
3(2)-y=3 \\
6-y=3 \\
6-3=y \\
3=y
\end{gathered}
$$

SOLUTION: $(2,3)$

