$$
9-6 \text { day } 2 \text { SKip } 23,24,34,66
$$

Equation conversion. Use same "formulas" for coordinate conversion. What are they?

$$
\begin{array}{ll}
x=r \cos \theta & \tan \theta=\frac{y}{x} \\
y=r \sin \theta & r^{2}=x^{2}+y^{2}
\end{array}
$$

Rectangular to polar.

$$
\text { Ex 1) } x^{2}+y^{2}=81
$$



$$
\begin{aligned}
& \begin{array}{l}
\operatorname{Ex} 2) x=8 \\
\downarrow \\
\begin{array}{l}
\frac{r \cos \theta}{\cos \theta}=\frac{8}{\cos \theta} \\
r=8 \sec \theta
\end{array} \\
\text { ven tical } 1, \\
8 /(\cos (\theta))
\end{array}
\end{aligned}
$$



Polar to rectangular.

$$
\begin{gathered}
\text { Ex 3)r=2 } \\
r^{2}=2^{2} \\
x^{2}+y^{2}=2^{2} \\
x^{2}+y^{2}=4
\end{gathered}
$$

$$
E \times 4) \theta=(\pi / 3
$$

$$
\tan ^{n} \theta=\frac{y}{x}
$$

$$
\begin{aligned}
& \tan \frac{\pi}{3}=\frac{\frac{\sqrt{3}}{2}-2}{\frac{1}{2}} \div \sqrt{3}: \\
& (x) \sqrt{2}
\end{aligned}
$$



$$
\begin{aligned}
& \begin{array}{c}
\operatorname{Ex} 5) r=\sec \theta \\
(\cos \theta) \\
r \cos \theta=\frac{1}{\cos \theta}(\cos \theta) \\
(x=1 \\
\text { Vertical line }
\end{array}
\end{aligned}
$$

