REAL WORLD MODELING

1. Uber rates in Kansas City include a $\$ 3$ booking fee and $\$ 1.10$ base fare as well as $\$ 0.98$ per mile traveled. (a) Write a function for the total fare ( $F$ ) in terms of the number of miles(x))raveled. (b) What is the total fare for a 14-mile Uber trip?
$e q$. for $\Rightarrow y=F$ in terms of $=x$.

$$
\begin{aligned}
& f_{\text {ce }}=\$ 4.10 \quad \text { vat }=0.98 / \mathrm{mile} \\
& F=0.98 x+4.10 \\
& F=0.98(14)+4.10=\$ 17.82
\end{aligned}
$$

$$
\frac{\text { slop -int }}{y=\frac{m x+}{1}}
$$

1. A local plumber charges a service fee plus an hourly rate for labor. She charged $\$ 103.75$ for a job requiring 2.5 hours of labor and $\$ 88.70$ for a job requiring 1 hour and 48 minutes. (a) Write an equation for total cost ( $C$ ) $n$ terms of the numbers of hours ( $x$ ). (b) What is her hourly charge? (c) What is her service fee? (d) What would be the total charges for an 8 -hour job?

$$
\begin{aligned}
& (2.5,103.75)^{*}(1.8,88.70) \quad \frac{48}{60}=0.8 \\
& m=\frac{103.75-88.70}{2.5-1.8}=\frac{15.05}{0.7}=\frac{150.5}{7}=21.5 \frac{5}{\mathrm{hr}} \\
& y-y_{1}=m\left(x-x_{1}\right) \\
& y-88.70=21.5(x-1.8) \\
& \begin{array}{r}
y-88.7=21.5 x-38.7 \\
+88.7 \\
+88.7
\end{array} \\
& C=21.5 x+50 \\
& C=21.5(8)+50 \\
& =172.0+50 \\
& ={ }^{\$} 222
\end{aligned}
$$

How many hours for 5500

$$
500=21.5 x+50
$$

Linear Regression

1) Lire goes down the middle + points are evenly balanced on each side.
$r$ = correlation coefficient - how strong is the relationship between the $x+y$ data.
$r^{2}=$ coefficient of determination

- how well does the line fit the data $r^{2} \geq 0.75$ good
$0.50 \leq r^{2}<0.75$ fair $r \leq 0 . S$ poor
To judge quality of line:

1) Are points evenly balanced on either side of the line
2) $r^{2}$
3) How well does it predict the future?

