REAL WORLD MODELING

$4.10

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) traveled. (b) What is the total fare for a 14-mile Uber trip?

$$y = mx + b$$

↑ Rate   ↑ initial amt

$$y - y_1 = m(x - x_1)$$

Data that can be into 2 coordinates.

$$y = 0.98x + 4.10$$
$$F = 0.98x + 4.10$$
$$F = 0.98(14) + 4.10$$
$$F = \$17.82$$

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) in 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?

$(2.5, 103.75)$

$\dfrac{48}{60} = 0.8$

$\times (1.8, 88.70)$

$M = \dfrac{103.75 - 88.70}{2.5 - 1.8} = \dfrac{15.05}{0.7} = \$21.50$

$y - y_1 = m(x - x_1)$

$y - 88.70 = 21.5(x - 1.8)$

$y - 88.70 = 21.5x - 38.7$

$ +88.7 \qquad\qquad +88.7$

$y = 21.5x + 50$

$C = 21.5h + 50$

How many hours for $500?

$500 = 21.5h + 50$

$ -50$

$450 = 21.5h$

$20.93 = h$

Linear Regression

Residual
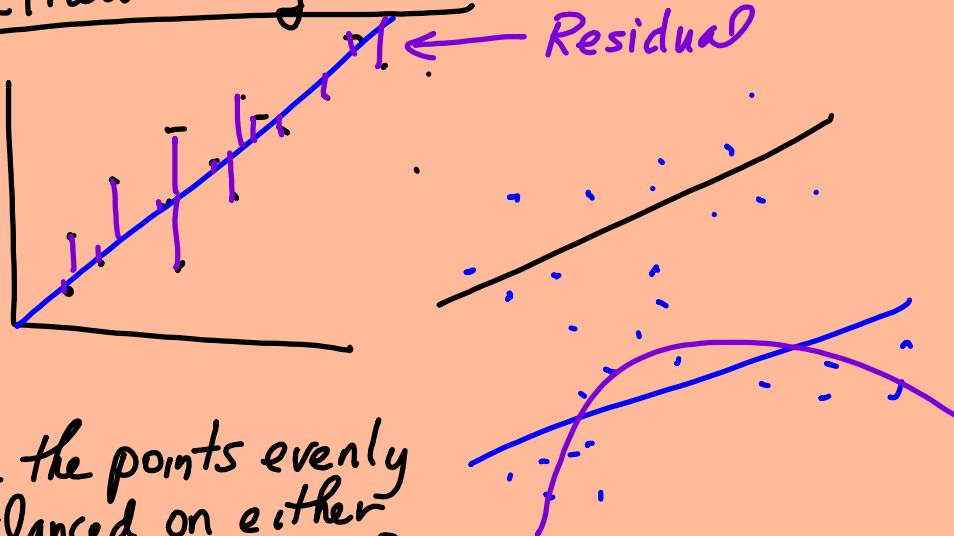
1) Are the points evenly balanced on either side of the line?

2) $r^2 > 0.75$

3) How well does it predict the future?

$r^2 > 0.75$ good
$0.50 \leq r^2 \leq 0.75$ fair
$r^2 < 0.50$ poor

$r =$ Correlation coefficient
how strong is the relationship between the x- + y-coord.

$r^2 =$ Coefficient of determination
how well the line fits the data