Forms of a Linear Equation:

Slope-Intercept	Point-Slope	Standard
$y = mx + b$	$y - y_1 = m(x - x_1)$	$Ax + By = C$
where m = slope and b = y-intercept	where m = slope and (x_1, y_1) is the given point on the line.	where A, B, and C are integers.

Parallel and Perpendicular Lines:

Parallel Lines	Perpendicular Lines
Parallel lines have the same slope. Ex: y = 5x +7 is parallel to y = 5x -19	Perpendicular lines have slopes that are negative reciprocals Ex: y = -5x + 32 is perpendicular to y = 1/5 x - 75

Steps to finding the Equation of a Best Fitting Line through a Scatter Plot.

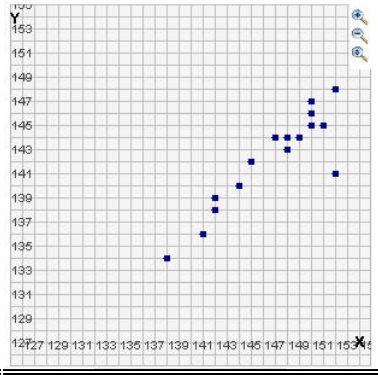
Example Problem:

FIGURE 2 Sample data

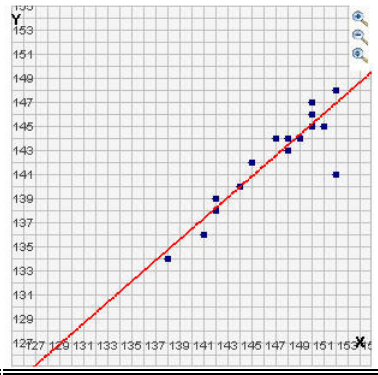
Subject	Height	Arm span
1	142 cm	138 cm
2	148 cm	144 cm
3	152 cm	148 cm
4	150 cm	145 cm
5	141 cm	136 cm
6	142 cm	139 cm
7	149 cm	144 cm
8	151 cm	145 cm
9	147 cm	144 cm
10	152 cm	148 cm
11	150 cm	147 cm
12	152 cm	141 cm
13	148 cm	144 cm
14	152 cm	148 cm
15	144 cm	140 cm
16	148 cm	143 cm
17	150 cm	146 cm
18	138 cm	134 cm
19	145 cm	142 cm
20	142 cm	138 cm

Steps:

1 Plot the points from the table in a scatter plot.



2 Draw the best fitting line through the scatter plot.



3 Identify 2 points exactly on the line. They may not be original data points, but rather a place where the line goes through the "cross-hairs" of the grid. In this graph, the line goes through (144, 140) and (136, 133)

4 Use $m = \frac{y_2 - y_1}{x_2 - x_1}$ to find the slope of the line. Here we have $m = \frac{140 - 133}{144 - 136} = \frac{7}{8}$

5 Then, use the slope and one of the two points from step 2 to find the equation. Since our graph does not show (0,0) we can't just look and see the y-intercept.

Ex: $y - 140 = \frac{7}{8}(x - 144)$

$y - 140 = \frac{7}{8}x - 126$

$y = \frac{7}{8}x + 14$