

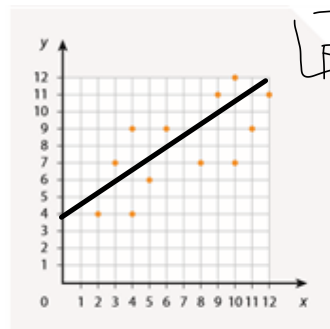
# Lesson 6: Regression Line

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## Intuitive Method:

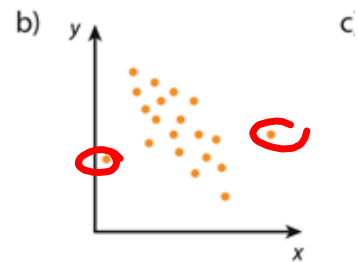
### Draw Line

- in same direction as points
- w equal # of points on each side.
- disregard outliers
- trail and erase



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3 graphs



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• Draw Regression Line

• Mean Point Method.

step i. find  $(\bar{x}, \bar{y})$

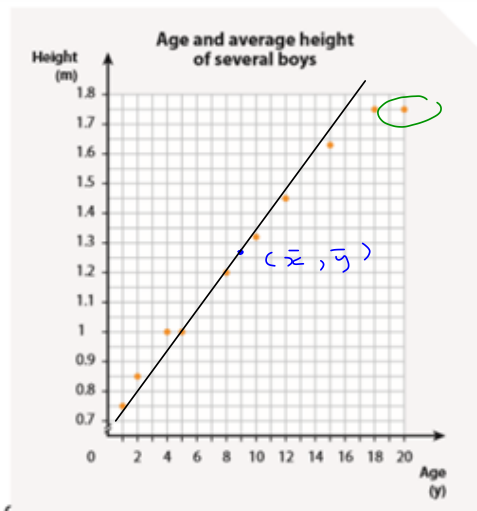
step ii plot  $(\bar{x}, \bar{y})$

step iii draw reg line thru  $(\bar{x}, \bar{y})$  following criteria

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Age (y)	Height (m)
1	0.75
2	0.85
4	1
5	1
8	1.2
10	1.32
12	1.45
15	1.63
18	1.75
20	1.75

$\bar{x} = 9.5$     $\bar{y} = 1.27$

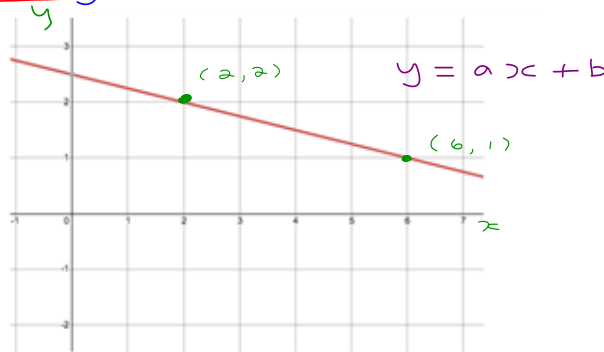


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Recall: Finding the Equation of a Line

Example 1:

Determine the equation of the line in graph to the right.



Step i: find

$$a = \frac{y_2 - y_1}{x_2 - x_1}$$

$$a = \frac{1 - 2}{6 - 2}$$

$$a = -\frac{1}{4}$$

$x_1, y_1$   
 $(2, 2)$   
 $(6, 1)$   
 $x_2, y_2$

Step ii: sub  $a$  into  $y = ax + b$

$$y = -\frac{1}{4}x + b$$

$$y = -\frac{1}{4}x + 2.5$$

Find value of  $b$  by  
subbing in point  $(x, y)$   
 $(2, 2)$

$$y = -\frac{1}{4}x + b$$

$$2 = -\frac{1}{4}(2) + b$$

$$2 + \frac{1}{2} = -\frac{1}{2} + b$$

$$2.5 = b$$

solve  
o.o.

write  
final  
equation

$$a = -\frac{1}{4}$$

$$b = 2.5$$

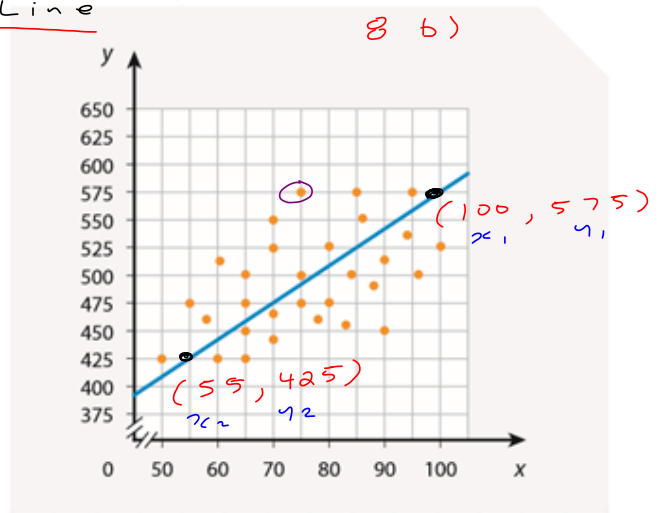
$$y = -\frac{1}{4}x + 2.5$$

Determining the Equation of The Regression Line

p 130  
8 b)

step i. identify points on line. If none use grid lines

(use mean point  $(\bar{x}, \bar{y})$  if doing Mean Point Method)



$$a = \frac{y_2 - y_1}{x_2 - x_1}$$

$$a = \frac{425 - 575}{55 - 100}$$

$$a = \frac{-150}{45}$$

$$y = ax + b$$

$$y = -\frac{150}{45}x + b$$

Pg 130 8 c) d)  
Pg 131 9 a) and b)  
Pg 139 #2  
Pg 140 #5

$$y = ax + b$$

$$425 = \frac{-150}{45}(55) + b$$

evaluate

$$y = -\frac{150}{45}x + 608.3$$

$$425 = -183.3 + b$$

$$608.3 = b$$

Solve  
w.o.o.  
to both  
sides