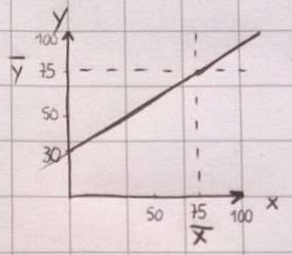
9.18

x = voto all'esame intermedio
y = voto all'esame finale
$\bar{x} = 75$ $S_x = 10$
$\bar{y} = 75$ $S_y = 10$



a) $\hat{y} = 30 + 0.6x$
i) $x = 100$ $\hat{y} = 30 + 60 = 90$
ii) $x = 50$ $\hat{y} = 30 + 30 = 60$

b) $r = \beta \cdot \frac{S_x}{S_y} = 1 = 0.6 \cdot \frac{10}{10} = 0.6$
$r^2 = 0.36$
[riduzione proporzionale dell'errore = 36%]

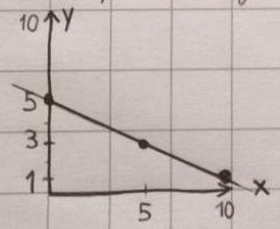
c) se $\hat{y} = x \Rightarrow \hat{y} = 0 + 1 \cdot x$
$r = 1 \cdot \frac{10}{10} = 1$

d) $\hat{y} = 75 \Rightarrow \hat{y} = 75 + 0x$
$r = 0 \cdot \frac{10}{10} = 0$

9.15

x = n° di libri letti durante l'anno
y = n° di ore prese al giorno davanti alla TV

x	y
0	5
5	3
10	1



a) $\hat{y} = \hat{\alpha} + \hat{\beta}x$
$\hat{\alpha} = 5$
$\hat{\beta} = \frac{\Delta y}{\Delta x} = \frac{5-3}{0-5} = -\frac{2}{5} = -0.4$
$\hat{y} = 5 - 0.4x$

$\bar{x} = 5$
$\bar{y} = 3$

$(x-\bar{x})^2$	$(y-\bar{y})^2$	$(y-\hat{y})^2$
$0-5 = (-5)^2$	$5-3 = 2^2$	$5-5 = 0^2$
$5-5 = 0^2$	$3-3 = 0^2$	$3-3 = 0^2$
$10-5 = 5^2$	$1-3 = (-2)^2$	$1-1 = 0^2$

$\hat{y} = 5 - 0.4x$
$\hat{y}_1 = 5 - 0 = 5$
$\hat{y}_2 = 5 - 2 = 3$
$\hat{y}_3 = 5 - 4 = 1$