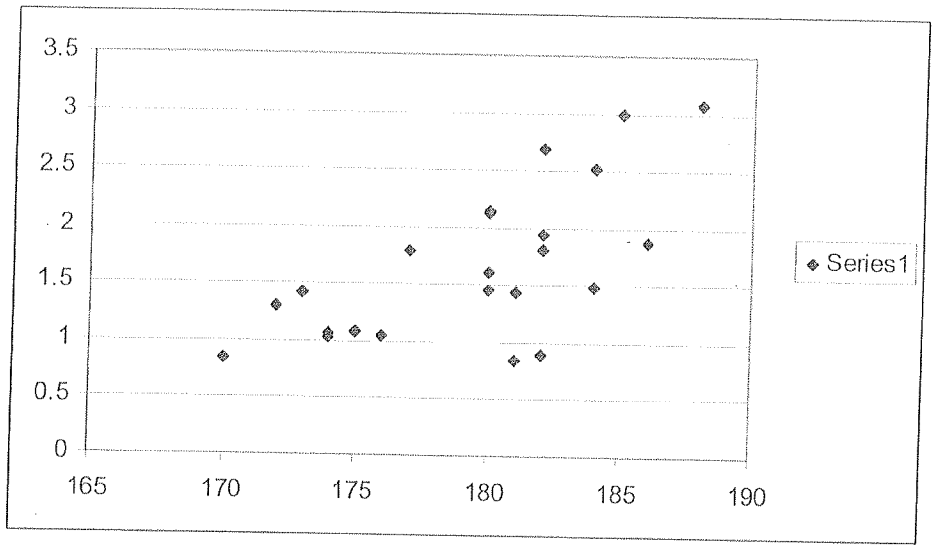
#1

b. No, if this were the case, then all values of y would be the same for unique values such as x = 180. In this case there are ratios of 1.45, 1.6, 1.61, 2.13, 2.15 when x = 180. This would not be possible if temperature were the only factor in determining ratio.

c. Although there may be a relationship here, there may be too much error from a model regression line to make any sound prediction. It appears that a test to see how useful our model may be is something worth pursuing.



#6

It looks like there is a linear relationship between resonance and sum-acceleration. The relationship looks negative where the higher the resonance, the lower the sums-acceleration. This is clearly not a perfect relationship in that variation exists. There are two rackets with uncharacteristic high resonance and low sum acceleration. It may be worthwhile to look @ more rackets.

#7 $\hat{y} = 1800 + 1.3X$

a. $\hat{y}|_{x=2500} = 1800 + 1.3(2500) = \underline{5050 \text{ psi}}$ ANS

b. $\underline{1.3 \text{ psi}}$ ANS (use β_1)

c. $(1.3)(100) = 130$ psi

d. $(1.3)(-100) = -130$ psi

#14

a. $y = 0.0942x - 15.2429$ (used Excel)

b. $y = (0.0942)(182) - 15.2429 = 1.9015$

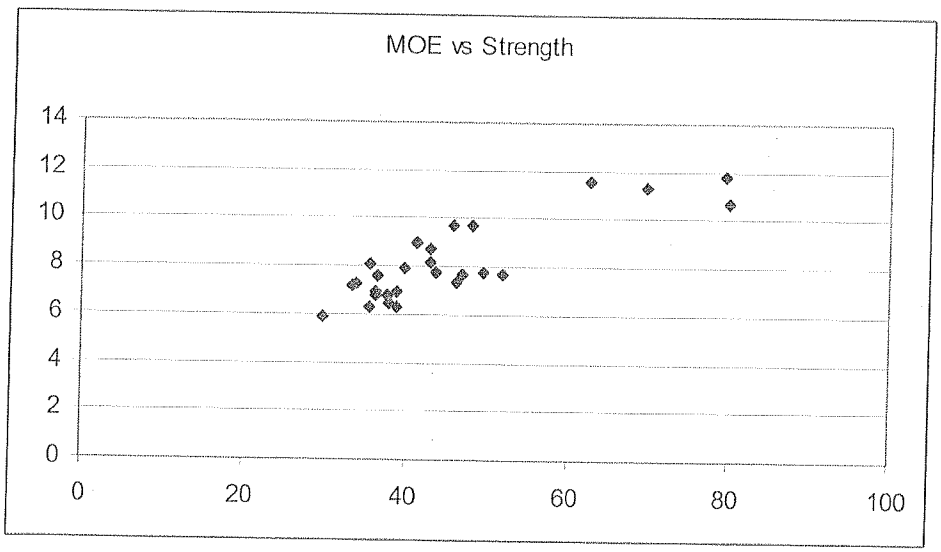
c. when $x = 182$, $y = 0.9, 1.81, 1.94, 2.68$ residuals $\Rightarrow$ $-1.0060, -0.0960, 0.0340, 0.7740$

We expect a value of 1.9015 when $x = 182$. Since 2 of the actual y-values are above 1.9015 & 2 are below 1.9015, the signs of the residuals are both positive and negative.

d. $R^2 = 0.4514$, so 45.14%

#15 cd

c.



$\hat{y} = 3.2925 + 0.107482x$

$\hat{y}|_{x=40} = 7.591786$

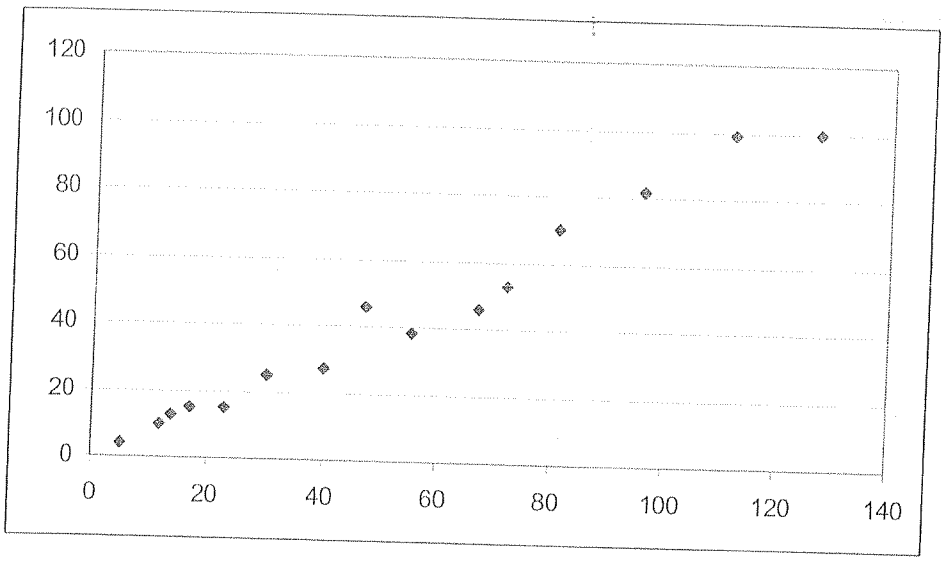
You should not extrapolate!

Since we do not have any MOE ≥ 100, we should not use our model to predict Strength when $x > 80$.

d. SSE = 18.7356
SST = 71.60519
$r^2 = 0.738349$

Yes, this model is a useful approximation of the relationship between MOE & Strength

#16



a. Yes

b. $b_1 = 0.82697$ ANS

$b_0 = -1.1283$ ANS

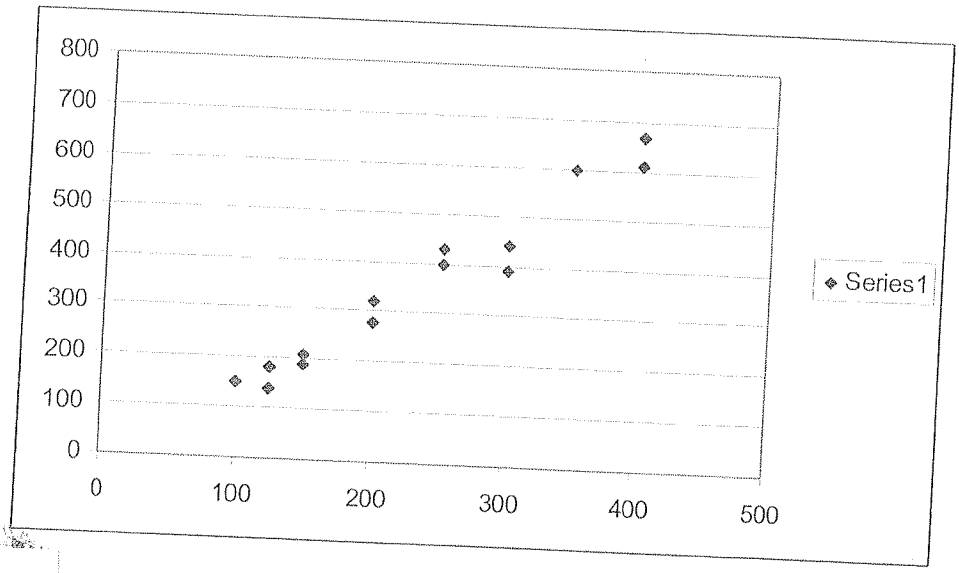
c. $\hat{y}|_{x=50}$

$= 40.22035$ ANS

d. $\sigma \approx s = 5.240762$ ANS

e. $r^2 = 0.975269$ ANS

#19



a. $\hat{y} = 1.71458x - 45.5519$

b. $\hat{y}_{x=200} = 339.5204$ ANS

c. $50(1.71458) = 85.5729$ ANS

d. You should never extrapolate!

Because the data were only x-values of up to 450, you should not use your linear model to predict outside that value!