Outline Answer for CIMT Statistics p223 Ex12A no. 2

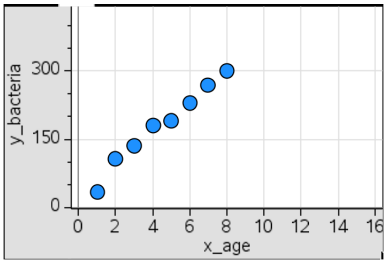
a) r_{XY}=-0.675845

b) r_{XZ}=-0.675845

c) r_{YZ}=1, as there is a defined linear relationship between them of $Z = \frac{Y}{10} + 3$

d) Comparing X and Y, t=-0.916969, P(t_1<-0.916969)=0.263779. We accept H_0 that ρ=0

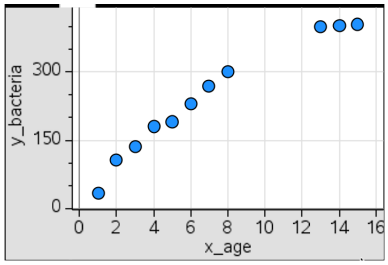
Outline Answer for CIMT Statistics p223 Ex12A no. 4



Correlation looks linear. r=0.989, and it passes a 5% hypothesis test on ρ

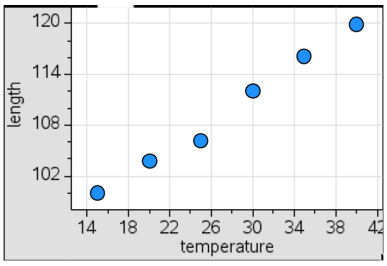
LinRegtTest *x_age,y_bacteria*,1,0: CopyVar

"Title"	"Linear Reg t Test"
"Alternate Hyp"	"β & ρ ≠ 0"
"RegEqn"	"a+b·x"
"t"	16.4841
"PVal"	0.000003
"df"	6.
"a"	21.7143
"b"	35.369
"s"	13.9054
"SESlope"	2.14564
"r²"	0.978396
"r"	0.989139
"Resid"	"{…}"



With extra data points, it no longer looks to have a linear relationship for age>8.

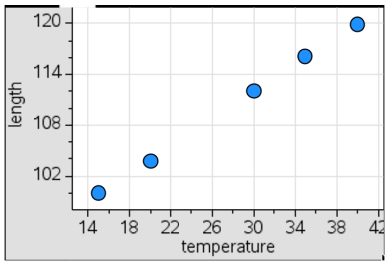
Outline Answer for CIMT Statistics p223 Ex12A no. 5



On the left is the original data set, with r=0.995094.

If we take the reading for (25,106.1) to be inaccurate in the sense that it seems lower than it ought to be, and remove it, we obtain r=0.999911 (see right)

Even if we hadn't removed the data point, it would have remained a good linear model.



LinRegtTest *temperature,length*,1,0: CopyVa

"Title"	"Linear Reg t Test"
"Alternate Hyp"	"β & ρ ≠ 0"
"RegEqn"	"a+b·x"
"t"	20.1162
"PVal"	0.000036
"df"	4.
"a"	87.2886
"b"	0.813143
"s"	0.845492
"SESlope"	0.040422
"r²"	0.990212
"r"	0.995094
"Resid"	"{…}"

LinRegtTest *temperature,length*,1,0: CopyVa

"Title"	"Linear Reg t Test"
"Alternate Hyp"	"β & ρ ≠ 0"
"RegEqn"	"a+b·x"
"t"	129.972
"PVal"	0.000001
"df"	3.
"a"	87.8884
"b"	0.802558
"s"	0.128044
"SESlope"	0.006175
"r²"	0.999822
"r"	0.999911
"Resid"	"{…}"