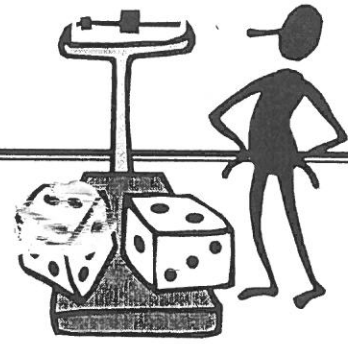


## Chapter 8: Linear Regression



### Key Vocabulary:

- parameter
- linear model
- predicted value
- residual
- line of best fit
- slope
- $\hat{y}$
- mean-mean point
- regression line
- $R^2$
- coefficient of determination

### Calculator Skills:

- LinReg (a + bx)
- RESID

1. Explain the quote (by George Box, a famous statistician), “All models are wrong, but some are useful.”
2. What are the *parameters* of the Normal model?
3. Describe the difference in notation between  $y$  and  $\hat{y}$ .
4. What is a *residual* and how is it calculated?
5. What does a negative *residual* indicate? A positive *residual*? A *residual* of zero?
6. How many *residuals* does a set of data have?
7. What is meant by a *line of best fit*?
8. The *line of best fit* always passes through which point?

9. The  $R^2$  value shows how much of the *variation* in the response variable can be accounted for by the linear regression model. If  $R^2 = 0.95$ , what can be concluded about the relationship between  $x$  and  $y$ ?

\_\_\_\_\_ % of the variability in \_\_\_\_\_ is accounted for by the linear relationship with \_\_\_\_\_.

10. What conditions are necessary before using a *linear model* for a set of data?

11. Explain how to construct a *residual plot*.

12. If a *least-squares regression line* fits the data well, what characteristics should the *residual plot* exhibit? Sketch a well-labeled example.

