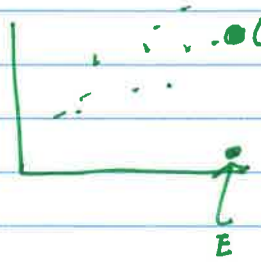
3R HW Chapter 3 AP PRACTICE TEST

Don't forget to complete Frappy's for HW.

T3.1 (D) $r=0$ Correct interpretation is (D)

T3.2 (E)



(b) not clearly negative r
(c) probably not a negative slope
(d) $r \neq .99$

T3.3 (C) r^2 EXPLAINS VARIATION EXPLAINED BY MODEL

T3.4 (A) SWITCHING X AND Y DOES NOT CHARGE THE CORRELATION

T3.5 (A) $\widehat{\text{ACTIVITY}} = 148.6 - 3.2(20.4) \approx 83$

LOOK AT RESIDUAL PLOT - FOR THE PREDICTED VALUE OF 83 → THE RESIDUAL WAS ABOUT 3.

$\text{RESIDUAL} = y - \hat{y}$

$3 = y - 83$

$y = 86$ ← The actual fish activity

T3.6 (C) $s = 4.785$ DEFINITION

T3.7 (B) CORRELATION HAS NO UNITS.

T3.8 (E) Formula sheet $b_1 = r \frac{s_y}{s_x}$ ($s_y = 1$, $s_x = 1$)

$b_1 = R$ ✓

STANDARDIZED x and y mean = 0 SD = 1

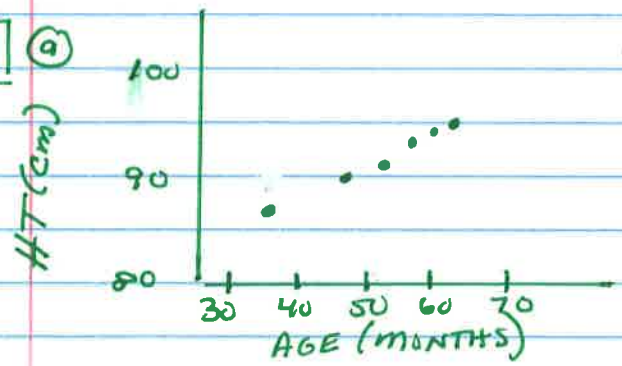
T3.9 (B) $\hat{y} = 25.2 + 3.3(5) = 41.7°F$

Predicted INCREASE $41.7 - 25.2 = 16.5°F$

T3.10 (C)

3R CONT

T3.11 (a)



(b) $\widehat{HT} = 71.95 + .38(AGE)$

$r = .99$ $r^2 = .9887$

Residual plot

NO PATTERN

(c) $\widehat{HT} = 71.95 + .38(480) = 254.35$ cm

$254.35 \text{ cm} \cdot \frac{1 \text{ IN}}{2.54 \text{ cm}} = 100.1 \text{ IN}$

At age 40 years (480 months), we predict Sarah's height to be about 100 inches (about 8 ft 4 inches)

(d) This height is impossibly large because we used extrapolation. Our data was based on 5 years and you can see that extrapolated well beyond 5 years results in unreliable results.

T3.12 (a) The unusual point is the one in the upper right corner with isotope value about 19.4 and silicon value about 350. This point is unusual since it is so high of a silicon value for the given isotope value

(b) Removing this point would have the following results

(i) The correlation (r) would increase because this point does not follow the linear pattern of the other points

(ii) Since the LSRL was pulled towards this point, removing it would change the LSRL — the slope would decrease and the y-intercept would increase

3R CONT

T3.13 (a) $\hat{y} = 92.29 - .05762x$

x = the number of wildebeest

y = % of Grass burned

OR

$\%\text{Grass} = 92.29 - .05762$ (wildebeest)

(b) THE SLOPE OF THE REGRESSION LINE SUGGESTS THAT FOR EVERY INCREASE OF 1,000 WILDEBEEST (THIS IS 1-UNIT INCREASE SINCE WILDEBEEST WERE MEASURED IN 1000s), We predict that the percent of grassy area burned will decrease by about .058, ON AVERAGE.

(c) $r^2 = .646$ $\quad r = \sqrt{.646} = -.804$

↑ NEGATIVE BECAUSE IT HAS THE SIGN OF THE SLOPE

Correlation of $-.804$ indicates a strong, negative, linear association between % grass burned and number of wildebeest.

(d) The linear model is appropriate for describing the relationship between wildebeest and % of grassed burned based on a review of the residual plot. The residual plot shows a fairly "random" scatter of points.

In addition, $r^2 = .646$, 64.6% of the variation in predicted % of grass area burned is explained by the regression line based on wildebeest abundance. That leaves 35.4% of the variation is unexplained by the linear model.