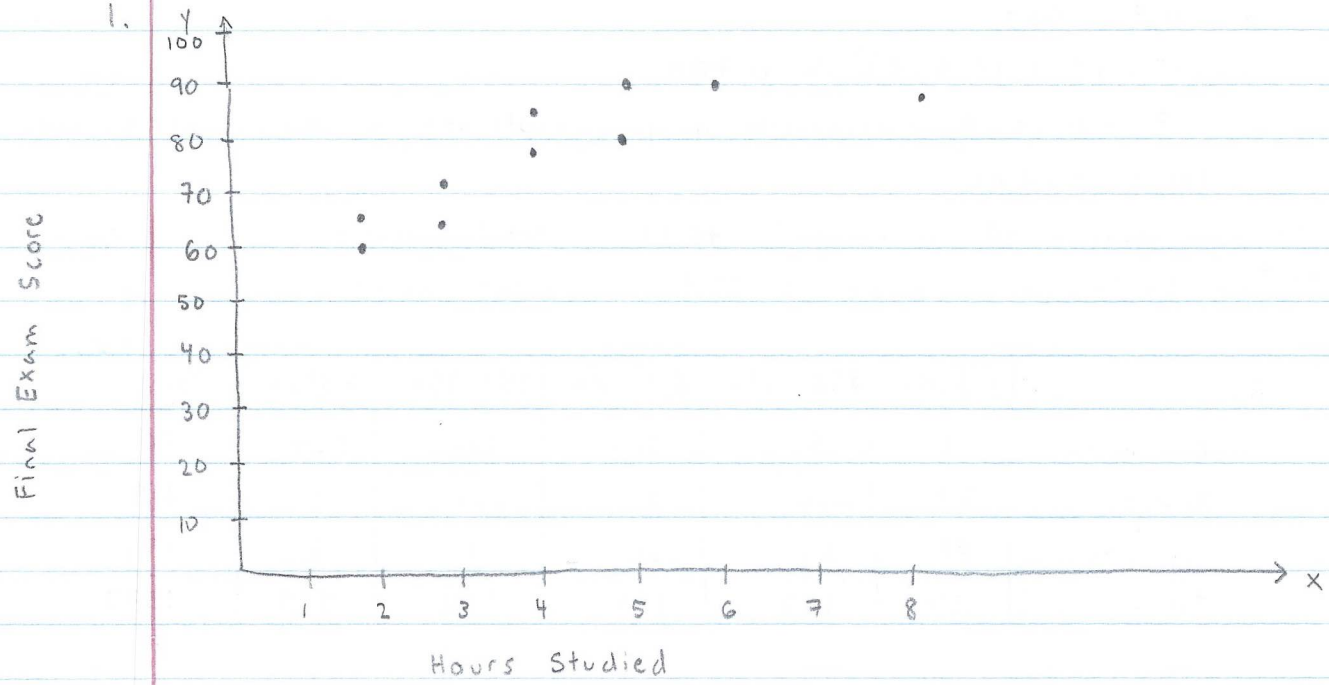
Dulaney, Stewart
MATH 54
Section 4053
SID: 1545566

Ch 4 and 5 Review Problems

1.



2. $r = 0.8465$

☐ Typo? 2.97

3. $\hat{y} = -0.206x + 2.097$

4. $\hat{y} = 0.45x - 30.27$

$\hat{y} = 0.45(95) - 30.27 = 12.48 \approx 12$

☒ Why?

No, not a reasonable question

$\hat{y} = 5.0443x + 56.1139$

5.

Hours, x	Scores, y	$\hat{y}$	$(y - \hat{y})$	$(y - \hat{y})^2$	
3	65	71.2468	-6.2468	39.0225	
5	80	81.3354	-1.3354	1.7833	
2	60	66.2025	-6.2025	38.4710	Σ Residuals^2 =
8	88	96.4683	-8.4683	71.7121	318.0379
2	66	66.2025	-0.2025	0.0410	
4	78	76.2911	1.7089	2.9203	
4	85	76.2911	8.7089	75.8449	
5	90	81.3354	8.6646	75.0753	
6	90	86.3797	3.6203	13.1066	
2	71	71.2468	-0.2468	0.0609	

6. $r = 0.837$

$R^2 = r^2 = (0.837)^2 = 0.701$

- 70.1% of the variability in y is explained by the least-squares regression line

□ Clarify this part

- Unexplained variation is 70.1% of total variation
- Explained variation is 29.9% of total variation

7.

	< $20k	$20 - 35k	$35 - 50k	$50 - 75k	> $75k	Totals
Own home	31	52	202	355	524	1164
Rent home	67	66	52	23	11	219
Live w/ family	89	69	30	4	2	194
Totals	187	187	284	382	537	1577

8. $S = \{$ HHHH, THHH, HTHH, HHTH, HHHT, TTHH, THTH, THHT, HTHT, TTTH, HTTT, TTTT, THTT, TTHT, HHTT, HTTH $\}$

9. $P(D) = 1 - P(A) - P(B) - P(C)$

$= 1 - \frac{1}{14} - \frac{1}{14} - \frac{1}{14} = 1 - \frac{3}{14} = \frac{11}{14}$

10. $E =$ "two heads" $= \{$ HHT, HTH, THH $\}$

$P(E) = \frac{N(E)}{N(S)} = \frac{3}{8}$

11. $P(A \text{ or } B) = P(A) + P(B) = 0.7 + 0.2 = 0.9$

12. $P(\text{divorced}) = \frac{21.7}{212.5} = 0.1021$ $P(\text{male}) = \frac{102.4}{212.5} = 0.4819$

$P(\text{divorced and male}) = \frac{9.0}{212.5} = 0.0424$

$P(\text{divorced or male}) = P(\text{divorced}) + P(\text{male}) - P(\text{divorced and male})$

$= 0.1021 + 0.4819 - 0.0424 = 0.5416$

13. $P(\text{jack}) = \frac{4}{52} = \frac{1}{13}$ $P(\text{club}) = \frac{13}{52} = \frac{1}{4}$

$P(\text{three}) = \frac{4}{52} = \frac{1}{13}$ $P(\text{diamond}) = \frac{13}{52} = \frac{1}{4}$

~~$\frac{12}{52}$~~ ?

A = "a jack"

B = "a three"

$P(A \text{ or } B) = \frac{4}{52} + \frac{4}{52} = \frac{8}{52}$

14. No

15. Mult. Rule for Independent Events

E = "white ball F = "blue ball"

$P(E \text{ and } F) = P(E) \cdot P(F) = \frac{10}{50} \cdot \frac{12}{50} = 0.2 \cdot 0.24 = 0.048$

~~0.0676~~ ?

16. $P(F \mid E) = \frac{P(E \text{ and } F)}{P(E)} = \frac{0.38}{0.8} = 0.475$

17. $P(\text{fair and college degree}) = \frac{44}{160} = 0.275$ $P(\text{fair}) = \frac{87}{160} = 0.5438$

$P(\text{college degree} \mid \text{fair}) = \frac{0.275}{0.5438} = 0.5057$

18. Gen. Mult. Rule

E = "1st solid" $P(E) = \frac{9}{32} = 0.2813$

F = "2nd solid" $P(F|E) = \frac{8}{31} = 0.2581$

$P(E \text{ and } F) = 0.2813 \cdot 0.2581 = 0.0726$

19. $_{20}P_4 = \frac{20!}{(20-4)!} = \frac{20 \cdot 19 \cdot 18 \cdot 17 \cdot \cancel{16!}}{\cancel{16!}} = 116280$

20. $_9C_5 \cdot {}_6C_4 = \frac{9!}{5!(9-5)!} \cdot \frac{6!}{4!(6-4)!} = \frac{9 \cdot 8 \cdot 7 \cdot 6 \cdot \cancel{5!}}{\cancel{5!} \cdot 4 \cdot 3 \cdot 2 \cdot 1} \cdot \frac{6 \cdot 5 \cdot \cancel{4!}}{\cancel{4!} \cdot 2 \cdot 1}$

$= \frac{3024}{24} \cdot \frac{30}{2} = 126 \cdot 15 = 1890$

21. $_{12}C_6 = 924 \qquad {}_8C_3 = 56 \qquad {}_4C_3 = 4$

$P(3 \text{ parents and } 3 \text{ teachers}) = \frac{{}_8C_3 \cdot {}_4C_3}{{}_{12}C_6} = \frac{56 \cdot 4}{924} = \frac{224}{924} = 0.2424$