Review Problems, Answer Key

1.) $X = \{R, A, C, E\}$

2.) Since the word "pretty" has different meanings to different people, there is no way of objectively determining what is and is not in the set.

3.)

(a) $n(A) = 5$

(b) $A' = \{1, 3, 5, 7, 9\}$

(c) $A \cup B = \{0, 2, 3, 4, 5, 6, 8\}$

(d) $(A \cap B)' = \{1, 2, 3, 4, 5, 6, 7, 9\}$

(e) $A' \cup B'$ = same as $(A \cap B)'$

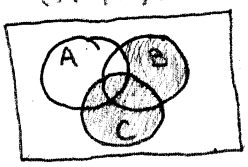
(f) $A \cap \phi = \phi$

(g) $A - B = \{2, 4, 6\}$

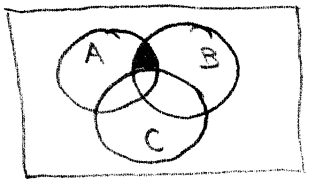
4.) $P = \{1, 2, 3\}$

5.)

(a) $(A' \cap B) \cup C$



(b) $(A \cap B) \cap C'$



6.) $\{1\}, \{2\}, \{3\}, \{1,2\}, \{1,3\}, \{2,3\}, \phi, \{1,2,3\}$

7.) $B = \{1, 2, 3, 4\}$

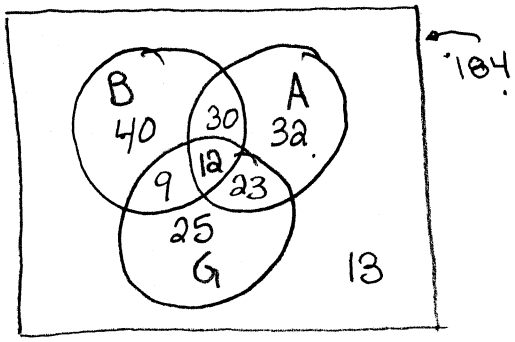
(a) $n(B) = 4$

(b) $\{a, b, c, d\} \sim B$

8.) X' IS THE SET OF ALL STATES THAT DO NOT HAVE TWO-WORD NAMES.

9.) $2^8 = 256$ SUBSETS

10.)



11.)

(a) $X - Y = \{0\}$

(b) $Y - X = \{a, b\}$

12.)

(a) DISJUNCTION

(b) CONJUNCTION

(c) CONDITIONAL

(d) BICONDITIONAL.

13.) IT DOES NOT HAVE A SINGLE UNIQUE TRUTH VALUE.

14.) (a) $q \rightarrow \sim p$: IF THE DOG IS A HUSKY, THEN IT DOES NOT HAVE BLUE EYES.

(b) $\sim(q \wedge p) \equiv \sim q \vee \sim p$: THE DOG IS NOT A HUSKY, OR IT DOES NOT HAVE BLUE EYES.

(c) $q \rightarrow (p \vee q)$: IF THE DOG IS A HUSKY, THEN IT HAS BLUE EYES OR IT IS A HUSKY.

15.)

p	q	$\sim q$	$\sim q \wedge p$	$\sim p$	$(\sim q \wedge p) \rightarrow \sim p$
T	T	F	F	F	T
T	F	T	T	F	F
F	T	F	F	T	T
F	F	T	F	T	T

16.)

(a) IF TODAY IS NOT TUESDAY, THEN TACOS ARE NOT ON SALE.

(b) IF TACOS ARE NOT ON SALE, THEN TODAY IS NOT TUESDAY.

(c) IF TACOS ARE ON SALE, THEN TODAY IS TUESDAY.

(d) CONTRAPOSITIVE

17.)

p	q	$p \rightarrow q$
T	T	T
T	F	F
F	T	T
F	F	T

p	q	$\sim p$	$\sim p \vee q$
T	T	F	T
T	F	F	F
F	T	T	T
F	F	T	T

IDENTICAL TRUTH TABLES.

18.) (a)

$\sim p \wedge \sim q$

(b) $\sim q \vee \sim r$

19.) (a) $I = (1925)(0.0275)(13.25) = \$701.42$

(b) $A = 1925 + 701.42 = \$2626.42$

20.) $I = 10730 - 7250 = 3480$

$3480 = (7250)(r)(12) \Rightarrow r = 0.04 = 4\%$

21.) (a) $A = 5000\left(1 + \frac{0.0735}{4}\right)^{(4)(15)} = \$14908.49$

(b) $I = 14908.49 - 5000 = \$9908.49$

22.) (a) $A = \frac{600\left[\left(1 + \frac{0.08}{4}\right)^{(4*20)} - 1\right]}{\left(0.08/4\right)} = \$116,263.17$

(b) $I = 116263.17 - 600(4)(20) = \$68,263.17$

23.) $R = \frac{12500\left(0.0725/12\right)}{\left[\left(1 + \frac{0.0725}{12}\right)^{(12*6)} - 1\right]} = \$139.10$

24.) $P = \frac{312\left[1 - \left(1 + \frac{0.0799}{12}\right)^{(-12\times5)}\right]}{\left(0.0799/12\right)} = \$15,390.98$

25.) (a) 10% of 182350 is 18235

Amount financed is $182350 - 18235 = \$164,115.^{00}$

(b) $R = \dfrac{164115\left(\frac{0.04125}{12}\right)}{\left[1-\left(1+\frac{0.04125}{12}\right)^{(-12\times30)}\right]} = \$795.^{38}$

(c) $I = 795.^{38} \times 12 \times 30 - 164115 = \$122,221.^{80}$

(d)

Payment #	Payment	Interest	Payment to Principal	Balance
1	$795.^{38}$	564.15	$231.^{23}$	$163,883.^{77}$
2	$795.^{38}$	563.35	$232.^{03}$	$163,651.^{74}$
3	$795.^{38}$	562.55	$232.^{83}$	$163,418.^{91}$

26.) ${}_{26}P_5 = 26 \times 25 \times 24 \times 23 \times 22 = 7,893,600$

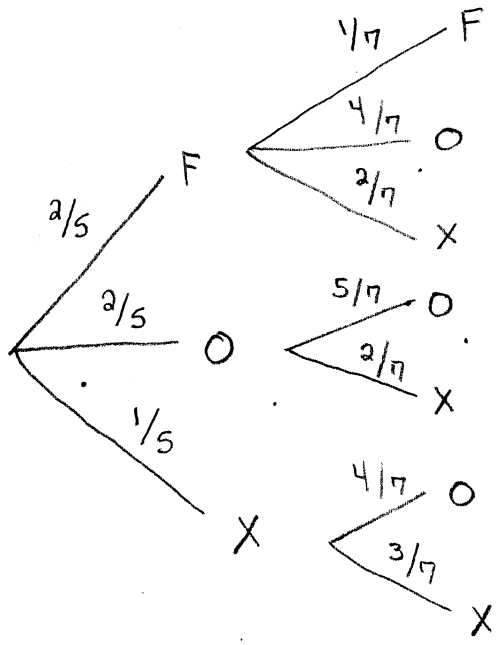
27.) $\dfrac{7!}{3!\,3!\,1!} = 140$

28.) (a) ${}_{34}C_5 = 278,256$

(b) ${}_{20}C_3 \times {}_{14}C_2 = 1140 \times 91 = 103,740$

29.)

(a)



(F, F)	$\frac{2}{35}$
(F, O)	$\frac{8}{35}$
(F, X)	$\frac{4}{35}$
(O, O)	$\frac{10}{35}$
(O, X)	$\frac{4}{35}$
(X, O)	$\frac{4}{35}$
(X, X)	$\frac{3}{35}$

(b) $\frac{4}{35} + \frac{4}{35} + \frac{4}{35} + \frac{3}{35} = \frac{15}{35}$

(c) $\frac{2}{35} + \frac{8}{35} + \frac{4}{35} + \frac{10}{35} + \frac{4}{35} = \frac{28}{35}$

30.)

(a) $\frac{350}{498}$

(b) $\frac{137}{498}$

(c) $\frac{137}{180}$

(d) $\frac{43}{148}$