1. 168
a. + 92
260

$\frac{260}{500} = \frac{52}{100} = 0.520$

b. 167
+ 168
335

$\frac{335}{500} = \frac{67}{100} = 0.670$

c. $\frac{167}{500} = \frac{33.4}{100} = 33.4$

d. $\frac{92}{500} = \frac{18.4}{100} = 18.4$

e (G) No and yes

2. 12 FtC 4 Female 8 Male
Probability that neither of them is a female is:
$8C2 = (8 \times 7)(1 \times 2) = 28$

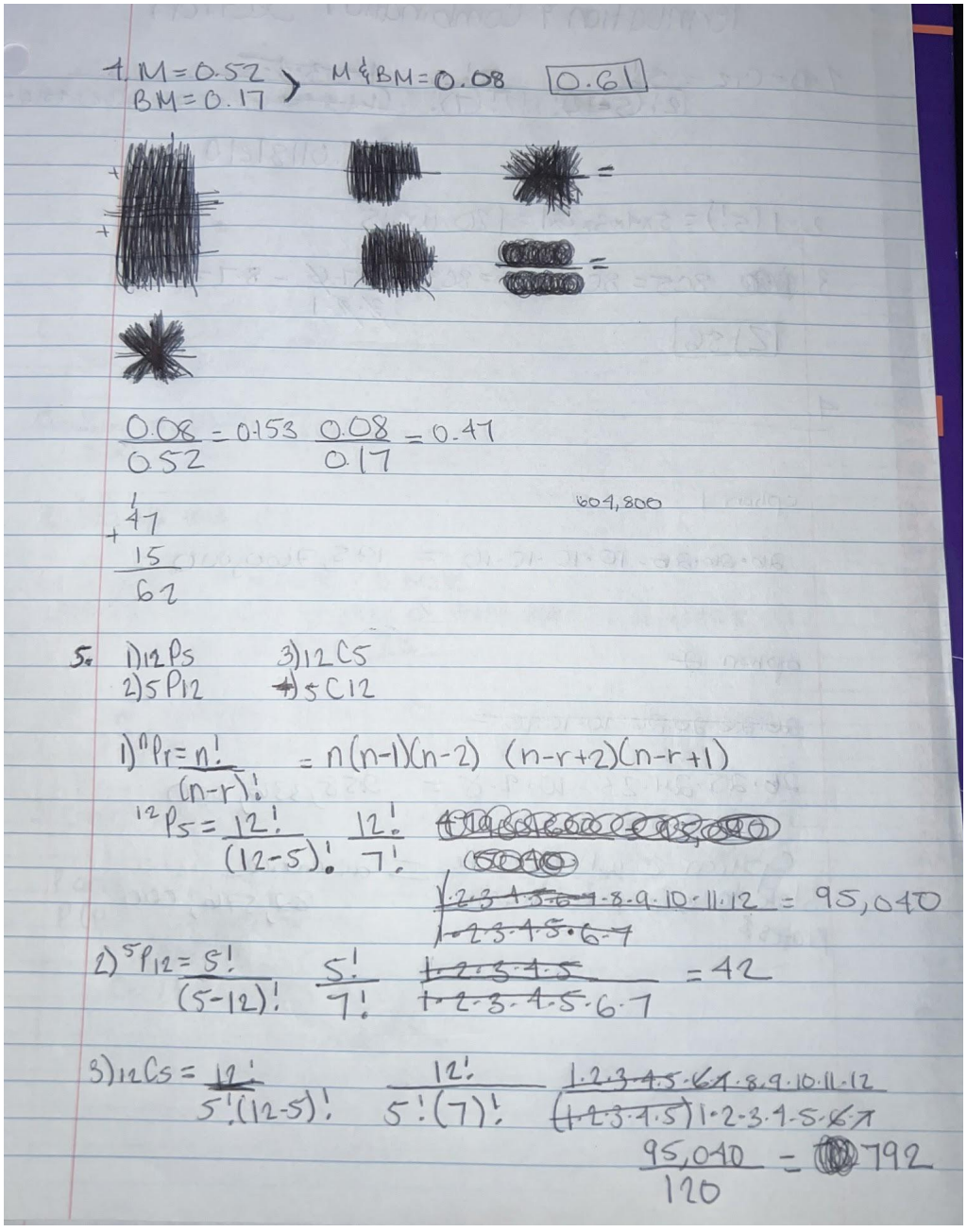
# of random pairs: $12C2 = (12 \times 11)(1 \times 2) = 66$
P(2 non-female selected) = 28 | 66 = 42%

3. Credit card 0.71 2 adults 1 posses a card
The other doesn't

P and B = P(A) x P(B) P(A) = 0.71
P(B) = 1 - P(A) = 0.30

0.71 x 0.30 = 0.213
0.21

5. (3) 12C5


1. M=0.52
BM=0.17
M&BM=0.08
0.61
0.08/0.52 = 0.153
0.08/0.17 = 0.47
604,800
47
15
62
5. 1)12P5 3)12C5
2)5P12 4)5C12
1) nPr = n!/(n-r)! = n(n-1)(n-2) (n-r+2)(n-r+1)
12P5 = 12!/(12-5)! 12!/7!
95,040
2) 5P12 = 5!/(5-12)! 5!/7! = 42
3) 12C5 = 12!/5!(12-5)! 12!/5!(7)!
95,040/120 = 792

NAME

Permuation & Combination Section

1. ~~$_{12}C_5 = \frac{5!}{12!(5-12)!} \quad \frac{5!}{12!(7)!} \quad \frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5}{(1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12)\,1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7}$~~

(3) $_{12}C_5$

2. $1(5!) = 5 \times 4 \times 3 \times 2 \times 1 = 120$ ways

3. $8C5 = 8C(8-5) = 8C3 = \frac{8 \cdot 7 \cdot 6}{3 \cdot 2 \cdot 1} = 8 \cdot 7 = 56$

(2) 56

4.

4. option 1

$26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 175{,}760{,}000$

option 2

~~$26 \cdot 26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10 =$~~

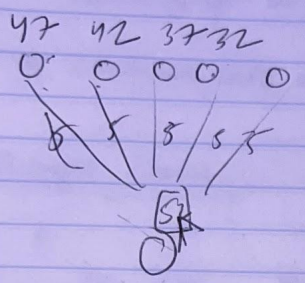
$26 \cdot 25 \cdot 24 \cdot 23 \cdot 10 \cdot 9 \cdot 8 = 258{,}336{,}000$

Option 2 will enable the State to issue more license plates ☺

$=$ difference $82{,}576{,}000$

5) $\frac{52!}{5!(52-5)}$ $\frac{52!}{5!(53)}$

(3) $\frac{52!}{5!}$



$\left(\frac{52}{5}\right)+\left(\frac{47}{5}\right)+\left(\frac{42}{5}\right)+\left(\frac{37}{5}\right)+\left(\frac{32}{5}\right)$

$=$

$\sqrt{\frac{12153\,5232!}{3125!}}$ $\frac{52}{5}$

~~7x4x1~~ 7x+x+

$\frac{7!}{3!(7-3)!}$ $\frac{7\cdot6\cdot5\cdot4\cdot\cancel{3\cdot2\cdot1}}{\cancel{(3\cdot2\cdot1)}(3!)}$

6 = 35 (2)

7) $\frac{21!}{5!(21-5)!}$ $\frac{21\cdot20\cdot19\cdot18\cdot17\cdot\cancel{16}}{\cancel{16\cdot15}\cdot14}$ $\frac{\cancel{21\cdot20\cdot19\cdot18\cdot17\cdot16}}{5\cdot4\cdot3\cdot2\cdot1}$ $=\frac{2,141,880}{120}$

$=20,349$

8) $=840$ $\frac{7\cdot6\cdot5\cdot4\cdot3\cdot2\cdot1}{3\cdot2\cdot1}=$

8) $\frac{7!}{3!} = \frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot \cancel{3 \cdot 2 \cdot 1}}{\cancel{3 \cdot 2 \cdot 1}} = \begin{array}{r} 42 \\ \times\ 20 \\ \hline 00 \\ 840 \\ \hline 840 \end{array}$

(1) 840

9) (4) $\frac{9!}{2!}$

10) (3) 7C3

11) 18S 4S $\frac{18!}{4!(18-4)} = \frac{18!}{4!(14)} = \frac{18 \cdot 17 \cdot 16 \cdot 15 \cdot \cancel{14}}{4 \cdot 3 \cdot 2 \cdot 1 \cdot \cancel{14}}$

(14)

$\frac{73,440}{24}$

(3) 3,060

12) 4A 4D 9D $\frac{9!}{4!(9-4)} = 9$

$4!(5)!$

$\frac{9 \cdot 8 \cdot 7 \cdot 6}{4 \cdot 3 \cdot 2 \cdot 1} = \frac{3024}{24} = 126$ (2) 126

13) - 20 20 handshaks

362,880 + 5040

14) $\frac{(9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1) + (7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1)}{(1 \cdot 2 \cdot 3) + (2 \cdot 1)}$ $\frac{367,920}{8}$

= 45,990 commitees

60,480

NAME

15) two mystery books: ${}_5C_2$ $\frac{(5\cdot4)}{(1\cdot2)}$ $\frac{20}{2} = 10$ sets

two biography books: ${}_6C_2$ $\frac{(6\cdot5)}{(1\cdot2)} = \frac{30}{2} = 15$ sets

combined sets = $10 \cdot 15 = \boxed{150 \text{ sets}}$

Multiple Choice

1. B

2. $\frac{10}{40}$ $\frac{x}{100}$ $\frac{40x}{40} = \frac{1000}{40}$ $40x = 1000$ $x = 25\%$

$\frac{10}{40} = \frac{25}{40}$ $x =$ ~~62.5%~~ 0.625

$\frac{1}{40}$ $\frac{x}{100}$ $40x = 100$

$\frac{25}{100} \div 5$ $\frac{5}{20} \div 5$ $\frac{1}{4}$

$\frac{10}{40}$ (B)

3. (B)

$\frac{40}{-2}$ $\frac{}{38}$

$\frac{40}{38}$

$\frac{n}{3} = \frac{x}{-3}$ $x = -3$ $b = -\frac{10}{40}$

4) C

5) D

6)