1

(a) $7! = 7 \times 6 \times 5 \times 4 \times 3 \times 1$

$= 5040$

(b) ${}_7P_1 = \frac{7!}{(7-1)!}$

$= 7$

(c)

${}_7C_1 = \frac{7!}{1!(7-1)!}$

$= 7$

(d) $P(7,7) = \frac{7!}{(7-7)!}$

$= 5040$

(e) $\binom{7}{2} = {}_7C_2$

$= \frac{7!}{2!(7-2)!}$

$= \frac{7!}{2! \times 5!}$

$= 21$

(f) $C(7,2) = \frac{7!}{2!(7-2)!}$

$= 21$

2
(a) $(3x-2y)^5$

$3x^5+(3x)^4(-2y)+(3x)^3(-2y)^2+(3x)^2(-2y)^3+3x(-2y)^4+(-2y)^5$

$243x^5+-162x^4y+108x^3y^2-72x^2y^3+48xy^4-32y^5$

1 5 10 10 5 1

$243x^5-810x^4y+1080x^3y^2-720x^2y^3+240xy^4-32y^5$

(b)

$2a^4-8a^3b+12a^2b^2-8ab+2b^4$

$2a^2(a^2-4ab+6b^2)-2b(8a+b^3)$

$2a^2(a^2-2b(2a+3b)-2b(8a+b^3)$

3

(a) upper case letters $=26$
lower case letters 26
Total 52

$\frac{52!}{6!}$ $\quad {}_{52}P_6$

$\frac{52!}{(52-6)!}$

$=14658134400$

(4) 12 Cars Assuming there is one red and one orange

12!

= 479,001,600 Ways

(11)

Total arrangements are ~~include~~

5!

5 x 4 x 3 x 2 x 1

120

= probability the first

$\frac{1}{120}$

7 (a) 4725

4.725×10^3

Written as prime factors

$3^3 \times 5^2 \times 7$

Number of positive divisors

= 24

(b) How many of such divisors are divisible by 5

The divisors divisible by 5 include:

25, 15, 35, 45, 75, 105, 135, 175, 225, 315, 525, 675, 945, 1575, 4725

= 15 devisors

9

8

(a)

8 friends 3 are left handed

5 are right handed

Each team will comprise 4 members

P(all left)

$= \frac{3}{4} = 0.75$

(b) P(two left)

$\frac{2}{4} = 0.5$

9

10 $13 \times 4 = 52$

3 backs are two

Probability of getting 3 blacks

$\frac{2}{52} = \frac{1}{26}$

(11)

(a) 0·6 probability after resting

0.6×0.3

$= 0.18$

(b)

$0.6 \times 0.3 \times 0.6 \times 0.3$

0.0324

12

Probability it rains 12%

probability its snow $12 \times 2 = 24\%$

$12 + 24 = 36\%$

$100 - 36$

$= 64\%$

13.

(a)

After wining, their probabilities of winning are loosing L

Pedro – 60%

Sasha – 65%

If pedro won last week. this week, probability of winning is

Pedro = 60%

sasha = 100 − 60

= 40%

(b)

Pedro wins the game two weeks later

0.6×0.6

$= 0.36$

(c)

Pedro, = $\frac{60}{100} \times 100$ = 60 games

sasha = $\frac{40}{100} \times 100$ = 40 games

$6!(5$

(b) $\frac{52!}{6!(52-6)!}$

$= 20358520$

5

Prime numbers between 1-50

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41 43, 47

∴ 15 in number

$50-15 = 35$

Probability =

$\frac{35}{50} = \frac{7}{10}$

$= 0.7$

6

Odds for wining 4:5

$4+5=9$

$\cancel{\frac{4}{5}}$ $\frac{4}{9}$