Will May

MB HW

8.1

1.) a.) 35^7 c.) $26^3 \times 35^4$ 2.) a.) 40^6

b.) 9×35^6 d.) $26^3 \times 9^4$ b.) $(40^7)+(40^8)+(40^9)$

c.) $14 \times (40^7 + 40^8 + 40^9)$

3.) a.) 10^5 c.) $3^2 \times 10^3$

b.) 3×10^4 d.) 20^5

8.2 2.) a.) $f(abccba) = abc$ c.) $|B^4| = 2^4 = 16$

b.) $|B^3| = 2^3 = 8 = |P_6|$ $|P_7| = 16$

3.) a.) $f(a) = f(a)$; $a = b$ $\Rightarrow$ one-to-one

· Every image in E_{10} has a pre-image and B_9 and f is onto

∴ bijection

b.) $2^{10}/2 = 2^9$

8.3 1.) a.) $40 \times 39 \times 38 \times 37 \times 36 \times 35$

b.) $36 \times 39 \times 38 \times 37 \times 36 \times 35$

2.) a.) $3 + 2^9 = 1536$

4.) a.) $|P| = all \cdot 10$ $10 \cdot 2 \cdot 6 = 120$

$P2 =$ Senior only (3)

$P3 =$ Junior only (7)

8.4 1.) a.) $(2^7)^{27} = 2^{7 \cdot 27}$

b.) Each target has its own domain value pointing at it

c.) $(2^7)^{25} = 2^{7 \cdot 25}$

d.) None of 1-1 functions = (32!)

3.) a.) $10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 3,628,000$

b.) $1 \times 9! = 362,880$

c.) $2! \times 9! = 725,760$

8.5 1.) a.) 5 subsets of 5

b.) Not a 5-permutation as a entries are distinct

c.) $\frac{5!}{5(5-5)!} = 24$

8.5 2.) a.) (a,b,c,d,e,f,g), (a,b,d,e,f,c,g), (a,b,f,g,d,e,c),
(f,g,a,b,c,d,e)

b.) {a,b}, {a,b,c}, {a,b,c,d}, {a,b,c,d,e}

c.) $\frac{7!}{4!(7-4!)} = 35$

d.) $\frac{7!}{3! \times 4!} = 35 \times 2 = 70$

3.) a.) $2^{10} = 1024$

b.) $2^7 = 128$

c.) $2^7 + 2^8 = 384$

d.) $4 \times 2^6 = 256$

8.) a.) 52 choose 5

b.) $\binom{13}{2} \cdot \binom{39}{3}$

c.) $\binom{13}{5} \cdot \binom{13}{0} + \binom{13}{4} \cdot \binom{13}{1} + \binom{13}{3} \cdot \binom{13}{2} + \binom{13}{2} \cdot \binom{13}{3} + \binom{13}{1} \cdot \binom{13}{4} + \binom{13}{0} \cdot \binom{13}{5}$

d.) $\binom{13}{1} \cdot \binom{39}{1}$

8.6 1.) a.) $\frac{371!}{4!(371-4)!} = 66045$ b.) $\frac{371!}{(37-4)!} = 1585080$

2.) a.) $\frac{120!}{30!(120-30)!}$ b.) 30 choose 5

6.) a.) $\binom{44}{5} \cdot \binom{56}{5} = 4.1483 \times 10^{12}$ b.) $\binom{44}{1} \cdot \binom{43}{1} = 1892$

$\binom{56}{1} \cdot \binom{55}{1} = 3080$

4972

8.7 2.) a.) $\binom{52}{5} - \binom{39}{5} = 2023203$

b.) $\binom{52}{5} - \binom{13}{5} \cdot 45 = 1281072$

3.) a.) 256

b.) 32