

Will May

M9 HW

9.1 1.) a.) NUMBER

$$\frac{6!}{1!5!} \times \frac{5!}{1!4!} \times \frac{4!}{1!3!} \times \frac{3!}{1!2!} \times \frac{2!}{1!1!} \times \frac{1!}{1!0!} = \frac{6!}{1!} = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$$

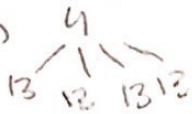
b.) DISCRETE

$$\frac{8!}{1!7!} \times \frac{7!}{1!6!} \times \frac{6!}{1!5!} \times \frac{5!}{1!4!} \times \frac{4!}{1!3!} \times \frac{3!}{1!2!} \times \frac{2!}{1!1!} = \frac{8!}{2!1!} = 20,160$$

c.) Subsets

$$\frac{7!}{3!} = \frac{7!}{3!4!} \times \frac{4!}{1!3!} \times \frac{3!}{1!2!} \times \frac{2!}{1!1!} \times \frac{1!}{1!0!} = \frac{7!}{3!} = 840$$

3.) a.)



$$\frac{52!}{13!39!} \times \frac{39!}{13!26!} \times \frac{26!}{12!14!} \times \frac{12!}{13!0!} = \frac{52!}{13!13!13!13!}$$

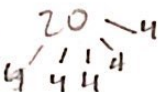
b.)



$$\frac{52!}{7!45!} \times \frac{45!}{7!38!} \times \frac{38!}{7!31!} \times \frac{31!}{7!24!} \times \frac{24!}{24!0!} = \frac{52!}{7!7!7!7!24!}$$

4.) a.) 5^{20} ways

b.)



$$\frac{20!}{4!16!} \times \frac{16!}{4!12!} \times \frac{12!}{4!8!} \times \frac{8!}{4!4!} \times \frac{4!}{4!0!} = \frac{12}{4!4!4!4!4!}$$

9.2 2.) a.) $\binom{15+6-1}{6-1} = \binom{20}{5}$ c.) $\binom{20}{5} - \binom{17}{5}$

b.) $\binom{12+6-1}{6-1} = \binom{17}{5}$ d.) $\binom{20}{5} + \binom{17}{5}$

4.) a.) $\binom{25+4-1}{4-1} = \binom{28}{3}$ c.) $\binom{28}{3} - \binom{18}{3}$

b.) $\binom{20+4-1}{4-1} = \binom{23}{3}$

5.) a.) $\binom{50+8-1}{8-1} = \binom{57}{7}$ c.) $\binom{57}{7} - \binom{37}{7}$

b.) $\binom{47+8-1}{8-1} = \binom{55}{7}$

9.3 1.) a.) $\binom{60+3-1}{3-1} = \binom{62}{2}$ c.) $\frac{60!}{25!35!} \times \frac{35!}{20!15!} \times \frac{15!}{15!0!} = \frac{60!}{25!20!15!0!}$

b.) 3^{60}

5.) a.) $\binom{10+25-1}{25-1} = \binom{34}{24}$

b.) $\binom{25}{10}$

9.5

1.) a.) $3^7 \times 4$ c.) $5+5+5=15$
 b.) $2+2+1=5$ d.) $3^7 \times 4 + 3^7 = (5 \times 3^7) \times 3 = 3^8 \times 5$

2.) a.) $2^{10}-1$ c.) $764-126=638$
 b.) $2^{10}-2$

4.) a.) 88
 b.) 92

9.6

1.) a.) $x^3 y^4 = \binom{7}{3} (-3)^3 (4)^4 = -241920$
 b.) $x^2 y^7 = \binom{9}{2} (5)^2 (-1)^7 = -900$
 c.) $x^5 y^3 = \binom{8}{5} (3)^5 (-4)^3 = -870912$
 d.) $x^6 y^1 = \binom{7}{6} (-2)^6 (-5)^1 = -2240$

2.) a.) 2^k
 b.) $(3)^k$