

Chapter 12 Review A

- How many different outfits can be made out of 4 pairs of pants, 8 shirts, and 3 belts?
- You recently created an account on a website where you needed to create a password. If the password must contain six characters where the first four are letters and the last two are digits,
 - how many different passwords are possible?
 - What if the digits and letters cannot be repeated?
- How many different ways are there to arrange 7 books on a shelf?
- A math teacher uses 4 algebra books, 2 geometry books, and 3 trig books for reference. In how many ways can the teacher arrange the books on a shelf if books covering the same subject matter are kept together?
- How many different ways are there to permute the letters in the word BANANAS?
- How many ways are there to arrange (permute) the letters in the word SENIOR?
- A high school needs 3 additional faculty members: two math teachers and a chemistry teacher. How many different ways can these positions be filled if there are 6 applicants for the math position and 2 for chemistry?
- The names of 36 students are put into a drawing. Three of the names are selected at random. The first student will receive a TV, the second will get an iPod, and the third will get a toaster. How many different ways can the TV, iPod, and toaster be given away?
- There are 36 students in another class. Three names will be selected. Those students will each get an iPod. (All 3 iPods are identical.) How many different ways can the iPods be given away?
- You have 2 hours to spend at an amusement park which is enough time to go on 3 rides. The park has 40 rides to choose from, how many possible ways are there to ride at most three rides.
- YLHS has 1300 students. Explain why at least 2 students must have the same pair of initials.
- Three couples go to the movies and sit together in a row of 6 seats. In how many ways can these people arrange themselves if each couple sits together?
- If a 3 letter word is formed by randomly choosing 3 letters from the word OCEAN, what is the probability that it is composed only of vowels?
- 5 fair 2-sided coins are tossed. What is the probability of getting exactly 3 tails?
- 8 out of 10 nutritionists recommend Brand X. If nutritionists A, B, and C are asked their opinions on Brand X, what is the probability that
 - all 3 recommend Brand X?
 - none recommends Brand X
 - at least one recommends Brand X
- A basketball player's free throw percent is .75. What is the probability that she scores on exactly 4 of her next 5 free throws.
- In a class of 38 students, what is the probability that at least one has the same birthday as you?
- In a survey of 1000 students at a school, 950 indicated that they were right-handed. Find the probability that at least 1 of 4 randomly chosen students from the school is left-handed.
- A standard deck of 52 cards is shuffled and the cards are dealt face up one at a time until an ace appears. What is the probability that the first ace appears on the third card?
- An auto insurance company charges younger drivers a higher premium than it does older drivers because younger drivers as a group tend to have more accidents. The company has 3 age groups: Group A includes those under 25 years old, 22% of its policy holders. Group B includes those 25-39 years old, 43% of its policy holders. Group C includes those 40 years old or older. Company record shows that in any given one-year period, 11% of its Group A policy holders have an accident. The percentages for groups B and C are 3% and 2% respectively. What percent of the company's policyholders are expected to have an accident during the next 12 months?
- Suppose Mr. X has just had a car accident. If he is one of the company's policyholders, what is the probability that he is under 25?
- Myopia is a condition that affects approximately 25% of the adult population in the US. Consider a random sample of 192 people, what is the probability that between 36 and 60 people have myopia?
- Simplify $\frac{{}^{n+2}C_3}{{}^{n+1}P_4}$
- Expand $(2x^2-3y)^4$.
- Find the coefficient of x^6 in the expansion of $(3x-5)^9$.

- $4 \times 8 \times 3 = 96$
- $26 \times 26 \times 26 \times 26 \times 10 \times 10 = 45,697,600$
- $26 \times 25 \times 24 \times 23 \times 10 \times 9 = 32,292,000$
- $7! = 5040$
- Algebra $4!$ Ways = 24; Geometry $2!$ Ways = 2; PreCalc = $3!$ Ways = 6. There are $3!$ Ways to arrange algebra, geo and trig so total combination $(24 \times 2 \times 6) \times 6 = 1728$

5. $\frac{7!}{3!2!} = 420$

6. $6! = 720$

7. $({}^6C_2) ({}_2C_1) = 30$

8. ${}_{36}P_3 = 42840$

9. ${}_{36}C_3 = 7140$

10. ${}_{40}C_1 + {}_{40}C_2 + {}_{40}C_3 = 10,700$

11. 26 choices for 1st initial and 26 choices for 2nd initial = 676. There are more students than there are initials.

12. 6 ways to fill first seat x 1 way to fill second seat (the spouse) x 4 ways to fill 3rd seat x 1 way to fill 4th (spouse) x 2 ways to fill 5th seat x 1 way to fill last seat = 48

OR: 2 ways for each couple to sit and 3 ways to arrange the couple.

13. ${}_3C_3 / {}_5C_3 = (1/10)$

14. ${}_5C_3 (0.5)^3 (0.5)^2 = 0.3125$

15. $(0.8)(0.8)(0.8) = 0.512$

b) $(0.2)(0.2)(0.2) = 0.008$

c) $1 - 0.008 = 0.992$

16. ${}_5C_4 (0.75)^4 (0.25)^1 = 0.3955$

17. $1 - \frac{365}{365} \cdot \frac{364}{365} \cdot \frac{363}{365} \cdots \frac{327}{365}$

$1 - \frac{{}^P_{38}}{365^{38}} \approx 86.4\%$

18. $1 - P(\text{all right handed}) =$

$1 - \left(\frac{950}{1000}\right)^4 = 0.1855$

19. $\frac{{}^P_2 \cdot {}^P_4 \cdot {}^P_1}{{}^P_3} \approx 0.0681$

20.



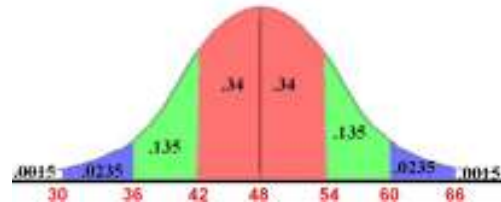
$(.22)(0.11) + (.43)(.03) + (.35)(.02) = 4.41\%$

21. $\frac{(.22)(.11)}{(.22)(.11) + (.43)(.03) + (.35)(.02)} = .549$

22. $\bar{x} = .25(192) = 48$

$\sigma = \sqrt{48(.75)} = 6$

$0.34 + 0.34 + 0.135 + 0.135 = 95\%$



23. $\frac{(n+2)}{6(n-1)(n-2)}$

24. $16x^8 - 96x^6y + 216x^4y^2 - 216x^2y^3 + 81y^4$

25. $-7,654,500$ (no X)