Algebra II

Period:

Review 12.1 - 12.3

Complete the entire review on a separate sheet of paper.

Useful Formulas:

$$\frac{n!}{q_1! q_2! \dots q_k!}$$

$$\frac{n!}{(n-r)!}$$

$$\frac{n!}{(n-r)! r}$$

1) Eight members of a school marching band are auditioning for 3 drum major positions. In how many ways can students be chosen to be drum majors?

2) Your school yearbook has an editor in chief and an assistant editor in chief. The staff of the yearbook has 15 students. In how many ways can a student be chosen for these 2 positions?

3) A relay race has 4 runners who run different legs of the race. There are 16 students on your track team. In how many ways can your coach select students to compete in the race? Assume that the order in which the students run matters.

4) Your must take 6 elective classes to meet your graduation requirements for college. There are 12 classes you are interested in. In how many ways can you select your elective classes?

5) A basketball team has five starting players. There are 13 girls on the team. In how many ways can the coach select players to start the game? (Assume each player can play every position.)

6) In a dog show there are 17 dogs. In how many different ways can the dogs win first, second, and third place?

7) A committee of five people is to be chosen from a group of 20 people. If no person is assigned any specific role in the committee, how many different 5 people committees are possible?

8) A committee of five people is to be chosen from a group of 20 people. How many different ways can a chairperson, assistant chairperson, treasurer, community advisor, and record keeper be chosen?

your ice cream?

10) An amusement park has 27 different rides. If you have enough time to go on 4 rides, how many different combinations of rides can you take?

11) Nine people in our class want to be on a 5-person basketball team to represent the class. How many different teams can be chosen?

12) 75 people run the Basking Ridge 5k and medals are only awarded to the 1st, 2nd, 3rd, 4th, and 5th place positions. How many different ways can the runners be awarded?

13) A deli offers 5 different types of meat, 3 types of breads, 4 types of cheeses and 6 condiments. How many different types of sandwiches can be made of 1 meat, 1 bread, 1 cheese, and 1 condiment?

14) Police use photographs of various facial features to help eyewitnesses identify suspects. One basic identification kit contains 15 hairlines, 48 eyes and eyebrows, 24 noses, 34 mouths, and 28 chies and 28 cheeks. Find the total number of different faces.

Determine how many different 5 digit postal zip codes are possible for the given configuration.

Problem	Digits are repeated	Digits are not repeated
15) Begins with a 4	1.10.10.10.10 Tone choice (#4) = 10.000	1. 4.8.7.6 = 3024 zip codes
16) Begins with a 3 or a 1	1.10.10.10.1010.00.0	1.4.8.7.6= 3024
=(# that be gin wl a3)+(# that begin w/1)	• 10 · 10 · 10 · 10 = 10,000 + • 10 · 10 · 10 · 10 = 10,000 20,000	1.9.8.7.6 = <u>3024</u> [6048]
OR ->	$\frac{2 \cdot 10 \cdot 10 \cdot 10 \cdot 16}{= 20,000}$	2.9.8.7.6=16048

Choose the statement below that is true about the given quantities.

- A. The number in column A is greater.
- B. The number in column B is greater.
- C. The two numbers are equal.
- D. The relationship cannot be determined from the given information.

	Column A	Column B	(A,B,C, or D)
17)	8 4 = 1680	8P2 = 56	A
18)	6!	$_6P_5$	C
19)	$_{12}P_{6}$	$_{12}C_{6}$	A

20) Find the number of distinguishable permutations of the letters in the word.

the word.
$$2 \times C$$

b. CINCINATTI $2 \times N$

a. CALIFORNIA
$$\rightarrow 2 \times A$$

$$2 \times I$$

$$10!$$

$$2! 2!$$

$$= \frac{10.9.8.7.6.5.\cancel{x}.3.\cancel{x}.1}{\cancel{x} \cdot \cancel{x}}$$

$$= 907200 \text{ permutations}$$

$$\frac{10!}{2! \ 3! \ 2! 2!} = \frac{10.9.8.7.6.5.4.3!}{2.37.2.2}$$

$$= \frac{10.9.8.7.6.5.4}{8} = \frac{75600}{}$$

21) Write the first six rows of Pascal's Triangle.

Expand the binomial.

22)
$$(x-y)^5$$
 use row 5:

$$\frac{1(x^{5}(y)^{9} + 5(x)^{7}(y)^{1} + 10(x^{3}(y)^{2} + 10(x^{3}(y)^{3} + 5(x)^{7}(y)^{4} + 1(x)^{6}(y)^{5}}{1 + 5(x^{3}(y)^{2} + 10(x^{3}(y)^{2} + 10(x^{3}(y)^{3} + 5(x)^{7}(y)^{4} + 1(x)^{6}(y)^{5}}$$

$$= \chi^{5} - 5\chi^{4}y + 10\chi^{3}y^{2} - 10\chi^{2}y^{3} + 5\chi^{4} - y^{5}$$

- Owrite the row # of
 Pascal's & that corresponds
 to "n"
 (a) (b) next to

23)
$$(3x-2)^4$$

$$= |(3x)^{4}(-2)^{3} + 4(3x)^{2}(-2)^{4} + 6(3x)^{2}(-2)^{2} + 4(3x)^{4}(-2)^{3} + 1(3x)^{4}(-2)^{4}$$

$$= 3^{4} x^{4} + 4 \cdot 3^{3} \cdot (-1) x^{3} + 6 \cdot 3^{2} \cdot 4 x^{2} + 4 \cdot 3 \cdot (-8) \cdot x + 16$$

$$= 81x^{4} - 216x^{3} + 216x^{2} - 96x + 16$$

$$(x+3)^{4} = 1(x^{4})(3)^{2} + 4x^{3}(3)^{4} + 6x^{2}(3)^{2} + 4x^{3}(3)^{4} + 1x^{6}(3)^{4}$$

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$$(x+3)^{4} = 1(x^{4})(3)^{2} + 4x^{4}(3)^{2} + 1x^{4}(3)^{2} + 1x^{4}(3)^{4} +$$

A jar contains 5 red marbles, 3 green marbles, 2 yellow marbles, and 1 blue marble. Find the probability of randomly drawing the given types of marbles

24) a yellow marble

25) a red marble

26) a blue or green marble

27) Thirty five students are in an Algebra 2 class that took a test. There were 9 A's, 18 B's, and 8 C's. What is the probability that a randomly chosen student did not receive a C?

$$\frac{N_0 + \varepsilon'^{5}}{1000} \Rightarrow \frac{27}{35} \approx .7714 = 77.14\%$$

Extra Practice (optional)

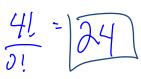
For the given configurations, determine how many different computer passwords are possible if (a) repetition is allowed and (b) if repetition is not allowed.

1. 2 letters followed by 4 digits

a. $26 \ 26 \ 9 \ 10 \ 10 = 6,76900$ b. $26 \ 25 \ 10 \ 9 \ 8 \ 7 = 3,276,000$ b. $5 \ 4 \ 3 \ 5 \ 4 = 200$

Find the number of distinguishable permutations of the letters in the following words.

3. MATH

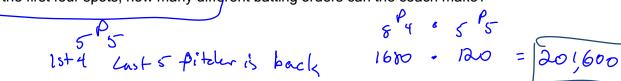




6. You are choosing curtains, paint, and carpet for your room. You have 12 choices of curtains, 8 choices of paint, and 20 choices of carpeting. How many different ways can you choose curtains, paint, and carpeting for your room?

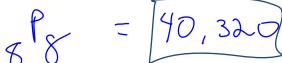


7. A baseball coach is determining a batting order for the nine players on the field. If the pitcher does not bat in one of the first four spots, how many different batting orders can the coach make?

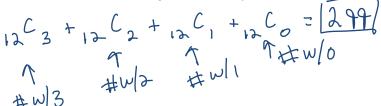


- 8. Next year you are taking math, English, history, TV, chemistry, physics, gym, and a study hall. Each class is offered during each of the eight periods in the day. In how many different orders can you schedule your classes?

& classes



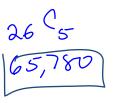
9. A pizza shop offers twelve different toppings. How many different pizzas can you order with no more than three toppings?



10. A basketball team has five starting players with individual positions. There are 13 girls on the team. In how many ways can the coach select the players for each individual position?

Find the number of 5-card hands that contain the specified cards.

11. 5 black cards

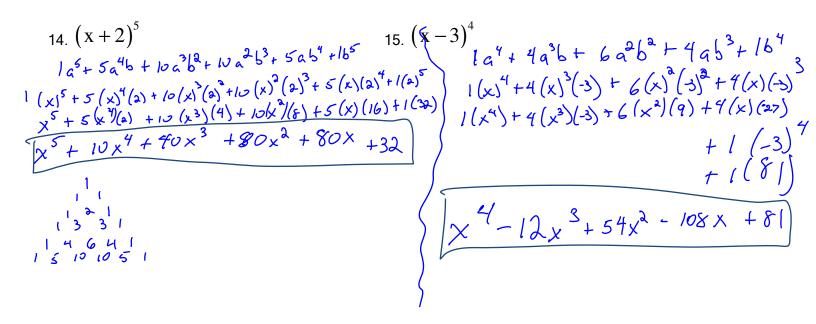


12. only face cards



13. 3 hearts and 2 diamonds

Expand the binomial using Pascal's Triangle.



^{**}For extra 12.3 Practice, refer to the book. You should know how to do the majority of the problems in that section.