

11-25-19 1<sup>st</sup> Trig

- ① I have kids Apple, Bumbo, and Cat. List out all the different ways I can put them in order to walk to the store.

A, B, C

A, C, B

B, A, C

B, C, A

C, A, B

C, B, A

- ② What if I have 6 kids?

$$\frac{6}{1^{\text{st}}} \cdot \frac{5}{2^{\text{nd}}} \cdot \frac{4}{3^{\text{rd}}} \cdot \frac{3}{4^{\text{th}}} \cdot 2 \cdot 1 = 720$$

6!

- ③ From you 15 students, we will pick a President and a V.P. How many options exist?

$$\frac{15}{\text{Pres.}} \cdot \frac{14}{\text{V.P.}} = 210$$

- ④ When I was a kid, license plates were 3 letters followed by 3 digits. How many plate possibilities exist?

$$\frac{26}{L} \frac{26}{L} \frac{26}{L} \cdot \frac{10}{D} \frac{10}{D} \frac{10}{D}$$

$$17,576,000$$

- ⑤ VA claimed they needed more possibilities, so they now allow 7 characters. How many plates can be made now?

$$\frac{36}{1^{th}} \frac{36}{2^{th}} \frac{36}{3^{th}} \frac{36}{4^{th}} \frac{36}{5^{th}} \frac{36}{6^{th}} \frac{36}{7^{th}}$$

$$36^7 = 7,836,416,410 \text{ (E10)}$$

$$78,364,164,100$$

- ⑤ My passcode is 3 letters followed by a digit and then one of these symbols: \$, %, &, #, or \*. What is the probability you guess my passcode on the 1<sup>st</sup> try?

$$\frac{26}{L} \frac{26}{L} \frac{26}{L} \cdot \frac{10}{D} \cdot \frac{5}{\text{Symbol}} = \frac{1}{878,800}$$

- ⑥ New login says it must be at least 8 characters. Now it can be upper case or lower case, a digit or one of 6 symbols. How many possibilities exist?

$$\frac{68}{1} \frac{68}{2} \frac{68}{3} \frac{68}{4} \frac{68}{5} \frac{68}{6} \frac{68}{7} \frac{68}{8}$$

$$68^8$$

$$4.571632397 \text{E} 14$$

$$45,716,323,970,000$$

11-25-19

- ① In how many ways can I put my 3 kids (Ankle, Butt Head, and Cat girl) in order to walk to the store? List out the possibilities.

A, B, C

A, C, B

B, A, C

B, C, A

C, A, B

C, B, A

6 possibilities

- ② What if I had 6 kids?

$$\frac{6}{1^{\text{st}}} \cdot \frac{5}{2^{\text{nd}}} \cdot \frac{4}{3^{\text{rd}}} \cdot \frac{3}{4^{\text{th}}} \cdot \frac{2}{5^{\text{th}}} \cdot \frac{1}{6^{\text{th}}} = 720$$

6!

- ③ How many ways can a soccer coach line up her players if she has just 11 players?

$$\frac{11}{\text{Goal}} \cdot \frac{10}{\text{striker}} \cdot \frac{9}{\text{shp.}} \cdot \frac{8}{\text{shp.}} \cdot \frac{7}{\text{shp.}} \cdot \frac{6}{\text{shp.}} \cdot \frac{5}{\text{shp.}} \cdot \frac{4}{\text{shp.}} \cdot \frac{3}{\text{shp.}} \cdot \frac{2}{\text{shp.}} \cdot \frac{1}{\text{shp.}}$$

$$11! = 39,916,800$$

- ④ When I was a kid, license plates were 3 letters followed by 3 digits. How many plates could be made

$$\frac{26 \cdot 26 \cdot 26}{L \quad L \quad L} \cdot \frac{10 \cdot 10 \cdot 10}{D \quad D \quad D}$$

$$17,576,000$$

- ⑤ We now have 7 characters on a plate. It can be all letters or all #s. How many plates can be made?

$$\frac{36}{1} \frac{36}{2} \frac{36}{3} \frac{36}{4} \frac{36}{5} \frac{36}{6} \frac{36}{7}$$

$$36^7 = 7,836,416,410 \times 10^1$$

78,364,164,100

- ⑥ From you 18, I will pick a President and V.P. How many ways can I do that?

$$\frac{18}{\text{pres}} \cdot \frac{17}{\text{V.P.}} = 306$$

⑦ How many different locker combinations are there?

$$\frac{50}{1^{\text{st}}} \cdot \frac{49}{2^{\text{nd}}} \cdot \frac{49}{3^{\text{rd}}} = 120,050$$

16-20-16

⑧ My passcode is 4 letters followed by 3 digits and then a symbol (6 to pick from). How many possibilities?

$$\frac{26}{L} \cdot \frac{26}{L} \cdot \frac{26}{L} \cdot \frac{26}{L} \cdot \frac{10}{D} \cdot \frac{10}{D} \cdot \frac{10}{D} \cdot \frac{6}{C}$$

2,741,856,000

11-25-19 4<sup>th</sup> Trig

- ① I have 3 kids (Ann, Bob, Chad). List out the different ways I can put them in order.

A, B, C

A, C, B

B, A, C

B, C, A

C, A, B

C, B, A

6 possibilities

- ② What if I had 6 kids?

$$\frac{6}{1^{\text{st}}} \cdot \frac{5}{2^{\text{nd}}} \cdot \frac{4}{3^{\text{rd}}} \cdot \frac{3}{4^{\text{th}}} \cdot \frac{2}{5^{\text{th}}} \cdot \frac{1}{6^{\text{th}}} = 720$$

6!

- ③ From you 17, we will pick a President and a V.P. How many ways can we do that?

$$\frac{17}{\text{Pres.}} \cdot \frac{16}{\text{V.P.}} = 272$$

- ④ My passcode is 4 digits followed by 4 letters. How many possibilities exist?

$$\frac{10}{0} \cdot \frac{10}{0} \cdot \frac{10}{0} \cdot \frac{10}{0} \cdot \frac{26}{L} \cdot \frac{26}{L} \cdot \frac{26}{L} \cdot \frac{26}{L}$$

$$4,569,760,000$$

- ⑤ As a kid, I remember license plates were 3 letters followed by 3 digits. How many plates could be made?

$$\frac{26}{L} \cdot \frac{26}{L} \cdot \frac{26}{L} \cdot \frac{10}{0} \cdot \frac{10}{0} \cdot \frac{10}{0}$$

$$17,576,000$$

- ⑥ Pick 7 letters or digits for your plate. How many different plates can be made?

$$\frac{36}{L \text{ or } 0} \cdot \frac{36}{L \text{ or } 0} \cdot \frac{36}{L \text{ or } 0} \cdot \frac{36}{L \text{ or } 0} \cdot \frac{36}{L \text{ or } 0} \cdot \frac{36}{L \text{ or } 0} \cdot \frac{36}{L \text{ or } 0}$$

$$36^7 = 7.83641641 \boxed{E10} \times 10^{10}$$

$$78,364,164,100$$

⑦ How many combinations exist on your locker?

$$\frac{50}{1^{\text{st}}} \cdot \frac{49}{2^{\text{nd}}} \cdot \frac{49}{3^{\text{rd}}} = 120,050$$

⑧ Passcode can be any digit, lowercase or uppercase letter, or one of 8 characters. If my passcode is only 5 characters long, how many codes exist?

$$\underline{70} \quad \underline{70} \quad \underline{70} \quad \underline{70} \quad \underline{70}$$

$$70^5 = 1,680,700,000$$

$$26+26+10+8$$