

[EXAM I IN CLASS REVIEW]

(answer key)

[1.] You have 9 different movies on your Netflix queue. In how many different ways can you order them?

$$> 9 * 8 * 7 * 6 * 5 * 4 * 3 * 2 * 1 = 362,880$$

[2.] You get a Groupon that allows you to get (and keep) 4 of the 9 movies on your Netflix queue. In how many ways can you choose your four movies?

$$> \frac{9*8*7*6}{4*3*2*1} = 126$$

[3.] In the U-Can-Win lottery, two balls are selected at random (without replacement) from 12 balls numbered 1 to 12. Your best friend was born on April 3 so you bet a 4 and a 3. What is the probability you will win?

$$> \frac{1}{66} = .015$$

[4.] Suppose I have three daughters and each has only one brother. How many children do I have? (no step or half children)

$$> 4$$

[5.] I have a bag with 10 red, 20 green, and 5 yellow marbles. I reach in and grab two (without replacement). What is the probability that I get two green?

$$> P(\text{green and green}) = \left(\frac{20}{35}\right)\left(\frac{19}{34}\right) = .319$$

[6.] I have a bag with 10 red, 20 green, and 5 yellow marbles. I reach in and grab two (with replacement). What is the probability that I get at least one red or yellow marble?

$$> 1 - P(\text{green and green}) = 1 - \left(\frac{20}{35}\right)\left(\frac{20}{35}\right) = 1 - .326 = .673$$

[7.] I have a bag with 10 red, 20 green, and 5 yellow marbles. I reach in and grab two (without replacement). What is the probability that I get at least one red or yellow?

$$> 1 - P(\text{green and green}) = 1 - \left(\frac{20}{35}\right)\left(\frac{19}{34}\right) = 1 - .319 = .681$$

[8.] If I have raised \$140 for my charity. That is 40% of my goal. How much money do I hope to raise?

$$> 140 = .4x \rightarrow \frac{140}{.4} = x \rightarrow x = \$350$$

[9.] How many ways are there to deal a two card hand from a standard 52-card deck?

$$> \frac{52*51}{2*1} = 1326$$

[10.] You are dealt a two card hand from a standard 52 card deck. What is the probability you got two 5's?

> **numerator:** $\frac{4 \cdot 3}{2 \cdot 1} = 6$

> **denominator:** 1326 (from last problem)

> **answer:** $\frac{6}{1326} = .0045$

[11.] A penny, dime, and nickel are tossed. You are told the penny came up heads. What is the probability all three are heads?

> $\frac{1}{4}$

[12.] I have 4 shirts, 5 pairs of pants, and 12 pairs of shoes. How many different outfits are possible?

> $4 * 5 * 12 = 240$

[13.] Nick's bank account had \$240 in it on Monday. On Tuesday, Nick spent \$60 of this money on Final Fantasy XIII: Lightning Returns. By what percentage did his bank account decrease?

> **25% decrease**

[14.] There are 8 people in a race. How many ways can first, second, and third place be awarded?

> $8 * 7 * 6 = 336$

[15.] The probability that Joe will get an A on his math test is 0.6. What is the probability Joe will not get an A?

> **0.4**

[16.] The probability that Jill will get an A on her math test is 0.75. The probability that she will get an A on her English test is 0.6. What is the probability she will get an A on both tests?

> $(.75)(.6) = .45$

[17.] An elevator containing 5 people can stop at any of seven floors. What is the probability that at least 2 people get off on the same floor?

> **#of ways for 5 people to get off on 7 floors = about 140**

> **#of ways for 5 people to get off on different floors** = $\frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = 21$

> $1 - P(\text{all different floors}) = 1 - \left(\frac{21}{140}\right) = 1 - .15 = .85$

[18.] Five shoppers buy an apple at the fruit stand. One in 10 apples at this fruit stand has a worm in the middle. You stop the shoppers as they leave and have them cut the apple in half to make sure there is no worm in it before they eat it. After cutting 5 apples, what is the probability that you have found one or more apples with a worm in the middle?

> $1 - P(\text{no worms in 5 apples}) = 1 - \left[\left(\frac{9}{10}\right)\left(\frac{9}{10}\right)\left(\frac{9}{10}\right)\left(\frac{9}{10}\right)\left(\frac{9}{10}\right)\right] = 1 - .59049 = .40951$

