Math 1000, Chapter 11 Review Name KEY

A bicycle lock uses a code that consists of 2 letters followed by one number. How many different combinations are there for this lock?

$26 \cdot 26 \cdot 10 =$ 6,760 combinations

What is the probability of opening the lock on your first attempt? $\frac{1}{6,760}$

What are the odds of opening the lock on your first attempt? 1:6,759

What are the odds **against** opening the lock on your first attempt? 6,759:1

Your advisor told you that you need to take a math course, a science course, and a history course next semester. You checked the course catalog and found that due to pre-requisites you have 2 math courses, 3 science courses, and 3 history courses to choose from. How many different combination of courses do you have?

$2 \cdot 3 \cdot 3 = 18$

Find the value of the following:

5! = 120

6nPr2 ($OR\ {}_6P_2$) 30

7nCr3 ($OR\ {}_7C_3$) 35

Several Math 1000 students decided to start a 'Gunderson Fan Club', which all the class members enthusiastically joined immediately. How many ways can the 22 member club elect a president, vice-president, and secretary?

Order matters

${}_{22}P_3 = 9,240$ ways

The fan club decided to send 4 students (chosen at random) to the mall to get Mr. Gunderson lots of nice gifts. How many different groups of students could be selected?

Order does not matter

${}_{22}C_4 = 7,315$ different groups

There were 12 females and 10 males in the club. 2 males and 4 females will be chosen to attend a fan club conference. How many different groups of students could attend?

${}_{12}C_4 \cdot {}_{10}C_2 = 22,275$ different groups

How many ways can the letters in the word PRONGHORNS be arranged?

2 - R's
2 - N's
2 - O's

$\frac{10!}{2!\,2!\,2!} = 453,600$ ways

A standard deck of 52 cards are used and you are dealt one card. What is the probability of being dealt a:

King of Diamonds? $\frac{1}{52}$ Any King? $\frac{4}{52} = \frac{1}{13}$ A face card? $\frac{12}{52} = \frac{3}{13}$ A red card? $\frac{26}{52} = \frac{1}{2}$

2 cards a dealt. What is the probability:

That the first card is a Jack and the second card is ten?

Jack AND Ten

$\frac{4}{52} \cdot \frac{4}{51} = \frac{16}{2652} = \boxed{\frac{4}{663}}$

That both cards are Kings?

King AND King

$\frac{4}{52} \cdot \frac{3}{51} = \frac{12}{2652} = \boxed{\frac{1}{221}}$

That the first card is black and the second card is a heart?

Black AND Heart

$\frac{26}{52} \cdot \frac{13}{51} = \frac{1}{2} \cdot \frac{13}{51} = \boxed{\frac{13}{102}}$

The first card is red and the second card is red, **or** the first card is a face card and the second card is a 2.

Red AND Red OR Face AND 2

$\frac{26}{52} \cdot \frac{25}{51} + \frac{12}{52} \cdot \frac{4}{51} = \boxed{\frac{349}{1,326}}$

Your friend rolled a fair die 100 times and the results were as follows: 1-14, 2-18, 3-12, 4-21, 5-15, 6-20

What is the experimental (empirical) probability, as a decimal, of rolling a die once and rolling a 5?

$\frac{15}{100} = .15$

What is the theoretical probability, as a decimal, of rolling a die once and rolling a 5?

$\frac{1}{6} = .1666\ldots$

What is the experimental (empirical) probability, as a decimal, of rolling a die once and rolling an even number?

$\frac{18+21+20}{100} = \frac{59}{100} = .59$

5) If you toss a fair coin 9 times, what is the probability of getting all heads?

Heads AND Heads AND Heads etc.

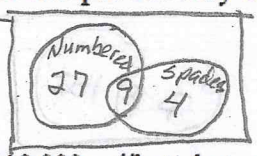
So $\frac{1}{2} \cdot \frac{1}{2} \cdot \ldots$ (9 times) $= \left(\frac{1}{2}\right)^9 = \frac{1}{512}$

A) $\frac{1}{512}$ B) $\frac{1}{256}$ C) $\frac{1}{1024}$ D) $\frac{1}{2}$

You are dealt one card from a 52-card deck. Find the probability that you are dealt:

2) a numbered card or a spade

A) $\frac{10}{13}$ $\frac{40}{52} = \frac{10}{13}$ B) $\frac{53}{52}$ C) $\frac{23}{52}$ D) $\frac{33}{52}$



6) The winner of a raffle will receive a new car. If 10,000 raffle tickets were sold and you purchased 20 tickets, what are the odds against your winning the car?

A) 9980 to 20 B) 20 to 9980 C) 20 to 10000 D) 10000 to 20

Probability of winning is $\frac{20}{10000}$, so odds in favor are 20 : 9980, so odds against are 9980 : 20

4) The table shows the number of employed and unemployed workers in the U.S., in thousands.

	Employed	Unemployed
Male	67,761	2433
Female	58,655	2285

= Total of 70,194 Males

Assume that one person will be randomly selected from the group described in the table. Find the probability of selecting a person who is employed, given that the person is male.

A) $\frac{67,761}{70,194}$ B) $\frac{2433}{70,194}$ C) $\frac{2433}{67,761}$ D) $\frac{2285}{70,194}$