Before we begin, are there any questions from last day's homework on experimental probability?

p. 66 # 1 to 4, 6, 7

Today's Learning Goal(s):

By the end of the class, I will be able to:

a) calculate the ***theoretical*** probability of an event.

MBF 3CI 2.2 Theoretical Probability Date: Feb. 27/17

From a probability experiment,

$$\textbf{Experimental probability} = \frac{\text{number of trials with successful outcomes}}{\text{number of trials}}$$

From the probability experiment with the coin from a previous class...

launch Fathom

# Trials = 10	# Trials = 100	# Trials = 25000
$\frac{7}{10} = 0.70$	$\frac{56}{100} = 0.56$	$\frac{12391}{25000} = 0.495$

In a probability experiment, if trials are repeated "again and again,"

(*such as thousands or millions of times*) the experimental probability will tend to equal the theoretical probability. This is known as the ...

Law of Large Numbers

☺ The theoretical probability should be able to be calculated without irst calculating the experimental probability! ☺

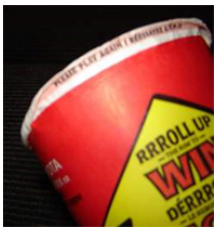
The ***theoretical*** probability of an event occurring is:

$$\textbf{Theoretical probability (of an event)} = \frac{\text{number of successful outcomes}}{\text{number of possible outcomes}}$$

And now for a discussion about RRRRRRRRRRRRoll up the rim…

(see the Smartboard for a simulation of the game)

launch Fathom



# Trials = 6	# Trials = 25000
P (win) = $\frac{0}{6}$	P (win) = $\frac{4288}{25000}$
= 0	= 0.171

To select an item at **random** means to choose the item not following a pattern or rule. Selecting the item must be "by chance".

Some ways to select items at **random** are….	Some ways to ***not*** select items at random are….
computer random generator **drawing from a hat** **lip a coin**	**alphabetical** **tallest/shortest** **birthdays** **wearing a certain colour; ex. red**

From now on, when a question says, "...ind the probability..." we always assume they are asking for the theoretical probability.

Express all inal answers as a fraction in lowest terms.

Ex. 1: A pet store has 8 cats, 9 dogs and 3 gerbils.
If Jocelyn randomly picks a pet, ind the probability that she:

a) picks a cat

$$P(\text{picks a cat}) = \frac{\text{number of cats}}{\text{number of possible pets}}$$

$$= \frac{8}{20}$$

$$= \frac{2}{5}$$

$$= 0.40$$

b) does not pick a cat

$$P(\text{does not pick a cat}) = \frac{\text{number of non-cats (other pet}}{\text{number of possible pets}}$$

$$= \frac{12}{20}$$

$$= \frac{3}{5}$$

$$= 0.60$$

P(does not pick a cat)
= 1 - P(picks a cat)

$= 1 - \frac{2}{5}$ $\quad 1 - 0.4$

$= \frac{3}{5}$ $\quad = 0.6$

Ex. 2: With a pair of fair dice, ind the probability of:

SUM

Red Die \ Blue Die	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

a) Rolling a total of 7 $P(\quad) = \frac{6}{36} = \frac{1}{6}$

b) Rolling an odd total $= \frac{18}{36} = \frac{1}{2}$

c) Rolling a sum of 7 or less $= \frac{21}{36} = \frac{7}{12}$

d) Rolling a total of 3 or 6 $= \frac{2+5}{36} = \frac{7}{36}$

e) P(sum of 14) $= \frac{0}{36} = 0$

Entertainment: pp.73-75 #3, 4, 5, 6, 8, 9, 11*, 12

(*For #11, you need the formula for the area of a circle: $A = \pi r^2$)

Attachments

- 2.ftm
- 2.ftm
- 2.ftm
- 2.ftm