

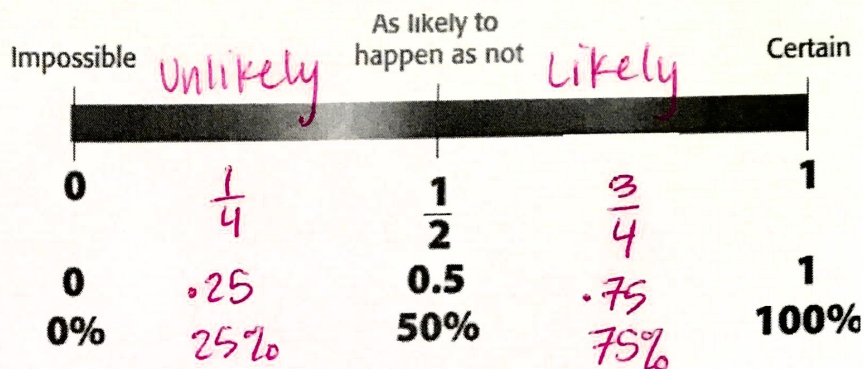
Notes 9-1

Int 1 Probability (Simple, Theoretical & Experimental Events) Unit 9

VOCABULARY

Probability: the likelihood of something happening

$\frac{1}{4}$ vs. $\frac{3}{4}$



$P(\text{event}) = \frac{\text{\# of ways event can happen}}{\text{total \# of outcomes}}$

Random: EVERY outcome has an equal chance of happening

Complementary Events:

An event and its opposite

*Probabilities ADD to 100%

Example: Heads vs. Tails
50% 50% = 100%

Ex. 1 There are six equally likely outcomes if a number cube with sides labeled 1 through 6 is rolled. Find the following. Write your answers as a fraction, decimal and percent.

- a) P(6) or the probability of rolling a 6. b) P(2, 3, or 4) c) P(not 1)



$\frac{1}{6} = .\overline{16} = 16.\overline{6}\%$

$\frac{3}{6} = \frac{1}{2} = .5 = 50\%$

$\frac{5}{6} = .\overline{83} = 83.\overline{3}\%$

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Ex. 2 The spinner at the right is spun once. Find the probability of each event. Write each as a fraction, decimal, and percent.

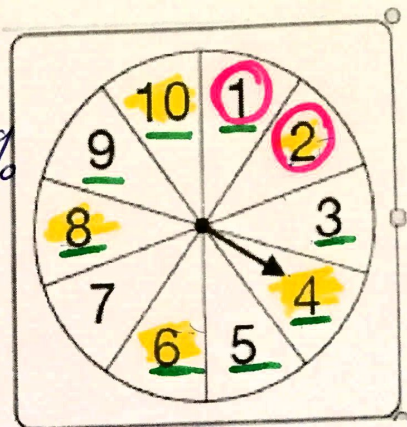
- d. P(neither 2 nor 7) e. P(a # less than 3) f. P(an even #)

$10 - 2 = 8$

$\frac{8}{10} = .8 = 80\%$

$\frac{2}{10} = .2 = 20\%$

$\frac{5}{10} = \frac{1}{2} = .5 = 50\%$



Write a sentence stating how likely it is for each event to happen. Justify using math.

- d. P(neither 2 nor 7)
80% > 50%

- e. P(a # less than 3)
20% < 50%

- f. P(an even #)
50% = 50%

LIKELY!
That I don't spin a 2 or 7

It is UNLIKELY that you spin a # less than 3.

EQUALLY LIKELY as not spinning even #.

Ex. 3

g) A bag contains 5 blue, 8 red, and 7 green marbles. A marble is selected at random. Find the probability the marble is not red.

h) Mr. Harada surveyed his class and discovered that 30% of his students have blue eyes. Identify the complement of this event. Then find its probability.

Total Outcomes: $5 + 8 + 7 = 20$

How many NOT red: $5 + 7 = 12$

⇒ Not having blue eyes.

$100 - 30 = 70\%$

$P(\text{not red}) = \frac{12}{20} = \frac{6}{10} = .6 = 60\%$

$P(\text{not blue eyes}) = 70\%$

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VOCABULARY:

Theoretical Probability:

What SHOULD happen

Experimental Probability:

What ACTUALLY happens

Ex. 4: A number cube is rolled 50 times. A 4 was rolled twelve times and a 5 was rolled seven times. What are the experimental probabilities of rolling a 4 and rolling a 5?



ROLLING a 4

$$\frac{12}{50} = .24 = 24\%$$

Rolling a 5

$$\frac{7}{50} = .14 = 14\%$$

Compare the experimental probabilities you found to their theoretical probabilities. If the probabilities are not close, explain a possible reason for the discrepancy.

Theo. Prob. of Rolling a 4: $\frac{1}{6} = .1\bar{6} = 16.\bar{6}\%$

Rolled a 4 more than I should have (24 > 16. $\bar{6}$)

"

Rolling a 5: $\frac{1}{6} = .1\bar{6} = 16.\bar{6}\%$

Rolled a 5 less than I should have (14 < 16. $\bar{6}$)

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Ex. 5 The spinner below is spun 50 times and lands on "You Win!" 39 times. What is the experimental probability?

Wheel A



$$\frac{39}{50} = .78 = 78\%$$

What is the theoretical probability of landing on "You Win!"?

$$P(\text{You Win}) = \frac{2}{4} = \frac{1}{2} = .5 = 50\%$$

Compare the Experimental probability with the theoretical probability of landing on "You Win!".

Lucky you! You landed on "You Win" more times than you should have since $78\% > 50\%$.