

MATH 5 CLASSWORK 23

May 9, 2021

We discussed today the product rule:

$$P(A) = \frac{\text{number of outcomes giving A}}{\text{total number of possible outcomes}}$$

Product rule

We already discussed computing probabilities for a single event/action such as rolling a die. Now let us consider what happens when we have more than one action.

Question: we roll a die twice. What is the probability of getting 2 on the first roll and 3 on the second?

Solution: rolling a die twice gives us a pair of numbers, each from 1 to 6. We will write the pairs like this: (2;3). We need to compute how many such pairs are there. The easiest way is to arrange them in a table like this:

| | | | | | |
|-------|-------|-------|-------|-------|-------|
| (1;1) | (1;2) | (1;3) | (1;4) | (1;5) | (1;6) |
| (2;1) | (2;2) | ..... | ..... | ..... | (2;6) |
| (3;1) | (3;2) | ..... | ..... | ..... | (3;6) |
| (4;1) | (4;2) | ..... | ..... | ..... | (4;6) |
| (5;1) | (5;2) | ..... | ..... | ..... | (5;6) |
| (6;1) | (6;2) | ..... | ..... | ..... | (6;6) |

There are 6 rows and 6 columns, so there are $6 \cdot 6 = 36$ possible pairs. Therefore, the probability of getting any one of them (e.g., (2; 3)) is $\frac{1}{36}$.

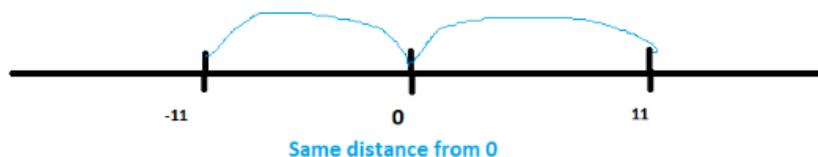
This gives the following multiplication rule for probabilities: if we are doing two tests then the probability of getting result A in the first test and B in the second one is

$$P(A \text{ and } B) = P(A) \cdot P(B)$$

if A and B can't happen together. This rule only applies if A and B **do not** happen together.

Example of solving equation with absolute value:

$$|7x - 3| = 11$$



$$7x - 3 = 11$$

$$x = \frac{11+3}{7}$$

$$7x - 3 = -11$$

$$x = \frac{-11+3}{7}$$

HOMEWORK 25

May 9, 2021

1. Compute:

a. $\frac{2^{1001}3^{999}}{6^{1000}} = 2^?3^?$

b. $3^7 + 3^7 + 3^7 = 3^?$

2. Write as Decimals: 101010b, 11100011b

3. Write 35

a. As binary

b. In base 4

c. in base 13

4.

5. Solve equations:

a) $\frac{3}{8}x = \frac{1}{3}$

b) $|12x - 5| = 9$

c) $\frac{x-2}{x-1} = 3$

6. Simplify:

$$\frac{6^5 \cdot 2^4}{3^5 \cdot 2^2} =$$

$$\frac{42^2}{6^2} =$$

$$\frac{9^2 \cdot 2^4}{6^2} =$$

$$\sqrt{\frac{4^2}{5^{10}}} =$$

$$\sqrt{12} =$$

7. Open parenthesis, simplify.

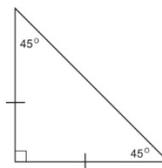
d. $(2x - 3)^2 =$

e. $(4x - 5)(4x + 5) =$

f. $3(a - 5) - 2(2a - 9) =$

8.

Find the length of legs, if
hypotenuse is 10?



9. You are fidgeting with a coin. What is the probability to get

a. TTH?

b. TTT?

c. at least one T (i.e. everything, but HHH)?