

Who is who?

Knights always tell the truth.
Knaves never tell the truth.

There are two people A and B, each of whom is either knight or knave. What are A and B?

- A. A says: "At least one of us is a knave."

Source: [3], #28

- B. A says: "Either I am a knave or B is a knight."

Source: [3], #29

- C. A says: "I am a knave, but B isn't."

Source: [3], #33

- D. See the picture on the right. Define who is Aditya and who is Bowie.



Source: [4]

Assume that there are 3 people: A, B and C, each of whom is either knight or knave.

- E. A: "All of us are knaves"
B: "Exactly one of us is a knight"
What are A, B and C?

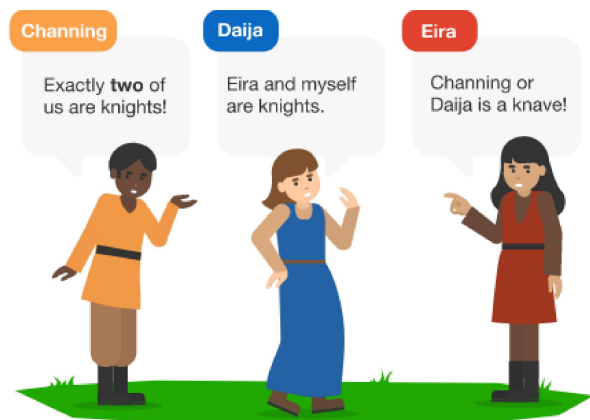
Source: [3], #31

- F. A: "B is a knave"
B: "A and C are of the same type"
What is C?

Source: [3], #34

- G. See the picture on the right.
Who is Channing?

Source: [4]



- 1) The traveller hired a native islander as a guide. On the way they met a man. The traveller asked the guide to find out what tribe this person belongs to. The guide returned and reported that the man called himself a knave.

Who was the guide - a knight or a knave?

Source: [2], #88266

- 2) The pirate Redbeard found the four manuscripts that gave information about the location of the hidden treasure.

P1: "The treasure is either on the island A or on the island D"

P2: "The treasure is on the island B"

P3: "The treasure is on the island C"

P4: "The treasure is not on the island D"



Only one manuscript is known to have the correct location of the treasure (the information on the other manuscripts is wrong), and it is hidden on one of the four islands.

Where is the hidden treasure?

Source: [1], 2019, 7-8 grades, #18.

- 3) Two types of inhabitants live on the island - knights and knaves. It is known that knights always tell the truth, knaves always lie.

A traveller met two men, a tall man and a short man, who lived there, and asked the tall man if they were both knights? He answered, but after this answer it was impossible to determine who they were, so the traveller asked the short man, whether the tall man was a knight?

Having received the answer "no", what conclusion made a traveller?

Source: [1], 2013, 11 grade, #30.

How many knights and knaves are there?

- 4) A teacher asked five of her students how many of them had pets. Paul replied that no one, Hanna that exactly one, Oksana, exactly two, Petro, exactly three, and Mykola replied that exactly four. The teacher knows that those who have pets tell the truth, and those who do not have - they are lying.

How many students have pets?

Source: [1], 2015, 7-8 grades, #21

- 5) There are 21 knights in the city who always tell the truth and 2000 knaves who always lie. Master divided 2020 of these 2021 people into 1010 pairs. Each person in the pair described the other person either as a knight or as a knave. Finally, 2000 people were called knights, and 20 were called knaves.

How many pairs of two knaves were there?

Source: [1], 2021, 7-8 grades, #28.

- 6) The group of 25 people consists of knights, knaves and tricksters. Every knight always tells the truth, every knave always lies, and every trickster tells the truth after he has lied and lies after he has told the truth.

When each of them was asked the question, "Are you a knight?", 17 of them answered, "Yes."

When each of them was then asked, "Are you a trickster?", 12 of them said, "Yes." When each of them was asked a third time, "Are you a knave?", 8 of them said, "Yes."

How many knights are in the group?

Source: [1], 2014, 7-8 grades, #27.

- 7) There are 2014 people standing in line, each of whom is either a knight, that is, one who always tells the truth, or a knave, that is, one who always lies. Each of them declared: "There are more knaves to my left than there are knights to my right."

How many knaves are there?

Source: [1], 2014, 9-10 grades, #30

- 8) On the island of Knights and Knaves the traveller met 7 people sitting around a fire (in a circle). Each of them said, "I am sitting between two knaves!".

How many knaves were there among these seven inhabitants of the island?

Source: [1], 2016, 11 grade, #28

Bibliography

This problem set has been composed by the team of Projekt MmF. The sources of all problems are given. The translations and slight adaptations are due to us.

[1] Archive of problem sets from Ukrainian Kangaroo for 2013 - 2022 years:

<http://kangaroo.com.ua>

[2] Archive of problems for mathematical olympiads:

<https://problems.ru/>

[3] Smullyan R.M. What is the name of this book?

[4] Website brilliant.org:

<https://brilliant.org/practice/knights-knaves-and-words/>

[5] Knights and knaves puzzle generator

https://christopherhelps.trinket.io/sites/knight_knave_puzzler