

EXERCISES: INTEGERS

1. Write, for each situation, two even numbers fulfilling that:
 - a) Their addition is a positive integer number and their quotient is a negative integer.
 - b) Their difference is a negative integer and their quotient is a positive integer.
 - c) Their addition is an even positive integer and the product of one of them by the contrary of the other one is a negative integer.
2. John says that he is 7 years older than Peter, and that he is 4 years older than Marc. Who is older, Peter or Marc? Represent the situation in a number line.
3. A painter is having fun going up and down on the stairs. In a specific moment, he is in the middle step and he moves himself as follows: he goes down 4 steps, goes up 3, goes down 2, goes up 5 and goes down 8. After that he is in the first step of the stairs. How many steps do the stairs have?
4. Pythagoras was born in the year -580 and he died in the year -500. On the other hand, Thales was born 44 years before Pythagoras and he died when the last one had 32 years old. Represent the whole situation in a number line. Who lived more years?
5. A thermometer has gone up by 5°C , and then it has gone down by 7°C , it has gone up by 4°C and it has gone down 11°C , indicating -6°C at the end. What was its first temperature?
6. A tank has an entrance tap which provides 5 liters per minute and it has also a drainpipe which drains 7 liters per minute. With respect the amount of water it has at the moment...
 - a) If only the entrance tap is working, what was the amount of water three minutes ago? How much water there will be after two minutes?
 - b) If only the drainpipe is working, how much water there will be after 3 minutes? What was the amount of water 4 minutes ago?
 - c) If both the entrance tap and the drainpipe are working simultaneously, what was the amount of water 6 minutes ago?
7. A boat is sunken at a depth of 200 meters. If it refloats at a speed of 2 meters per minute, what is the depth it will reach after one hour?
8. In a ski station the temperature goes down 1 degree each half an hour at night after 12 o'clock and until 5 o'clock in the morning. After that moment, it goes up 1 degree each 20 minutes until 9 o'clock in the morning. What is the temperature at 9 o'clock in the morning if the temperature at night at 12 o'clock was 4 degrees?
9. Pepe lives in a building with several floors. There is a floor for the storages (floor -1) and two parking floors (-2 and -3). We consider that floor 0 is the main floor of the building. One day Pepe left his home and after went down 6 floors he met his neighbour Michael. Later he went up three floors to take a coffee with his sister Mary. After coffee he went up 10 floors to do some sport at the gym and, finally, he went down 15 floors more to left the building driving his car, which was parked at floor -3. In which floor does Pepe live? Where did he meet Michael? Where is the gym?

10. The air temperature goes down as we go up in the atmosphere at a rate of 9 degrees every 300 meters. If the temperature at the sea level in a specific point is 6 degrees, what is the altitude a plane is flying if the air temperature at this point is -81°C ?
11. There are several people travelling by metro. In the first stop there are 18 people that go down and 46 people that go up. In the second one, there are 64 people that go down and 82 people that go up. In the third stop, there are 35 people that go down and 18 that go up. How many people travelled by metro initially if there are 229 people arriving to the fourth stop?
12. Cicero was born in the year 106 B.C. and he lived for 63 years, whereas Seneca was born 39 years after Cicero's death and he lived for 61 years. In which year did Seneca die?
13. Archimedes, who lived for 75 years, was born in the year 287 B.C. On the other hand, Eratosthenes was born when Archimedes was 11 years old, and he lived for 82 years. How many years did Eratosthenes outlast Archimedes?
14. If a woman were born 13 years before than she actually did, she would have been 36 years in the year 27 A.C. In which year was she born?
15. Compute the result of the following operations:

a) $3 - [-4 - (6 + 2 - 9) - (-2 - 3)] + (-2 + 3)$

c) $-28 \times [(-12 + 9) - (4 \times 3 - 12 : 3) + 5]$

e) $[(-2)^3 \times (-1)^5 + (-6) - (-3) + (-1)] \times (-2) + (-3)^2 + (-1)^{99}$

g) $(-3) \times [-4 - (-2)] + [8 - (-3 + 5)] \times 2$

b) $(+2) \times [(+4) - (-6) + (-2)] - (-12) : [(-8) - (-4)]$

d) $(-5) \times [-3 + 1 - (-4)] + (-2)^3$

f) $-1 - (-1) - [-(-1)] - \{-[-(-1)]\}$

h) $-5 \times 3 + 24 : 4 \times 2 - (12 - 5 \times 3 + 2 : 2 \times (-1)^7)$

16. Write a wording adapted to the linked movements on the line of the figure, and compute the result.



17. Invent a wording to be solved with the combined operation $(-2) \times 3 + 7 \times (-4) - 6$
18. By using the operations addition, subtraction, product and quotient, as well as using the brackets you need, combine the numbers inside the rectangles to obtain as result the number inside the circles.

-4	-10	20	60	=	2
2	-25	13	4	=	3