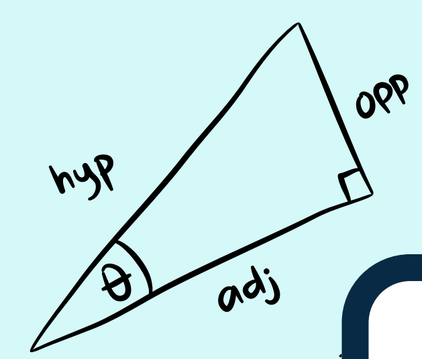
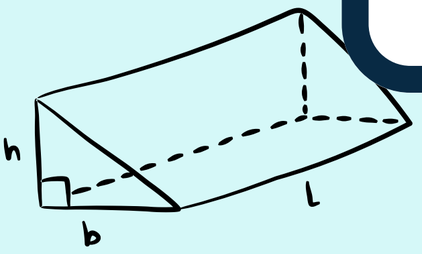
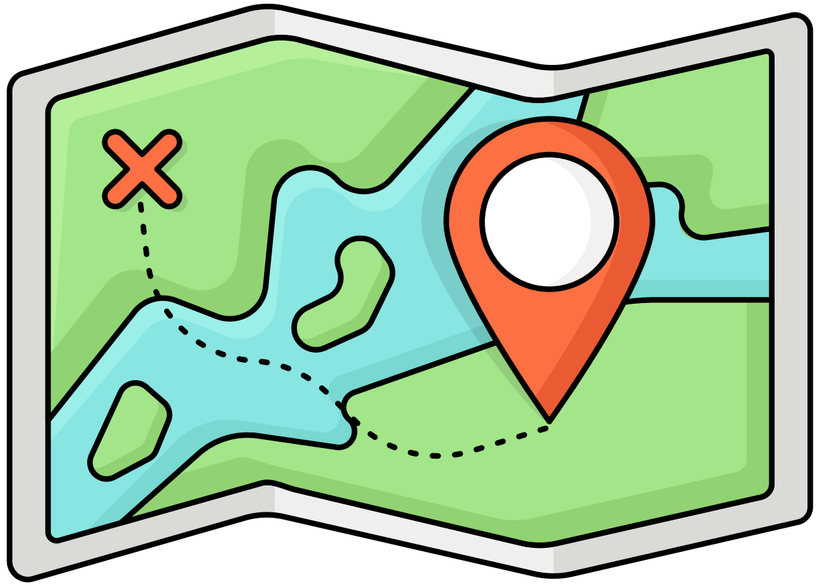
RELATIVE NUMBERS

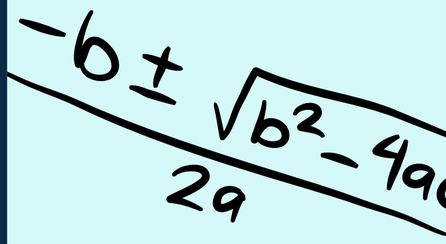


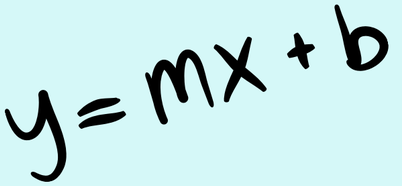


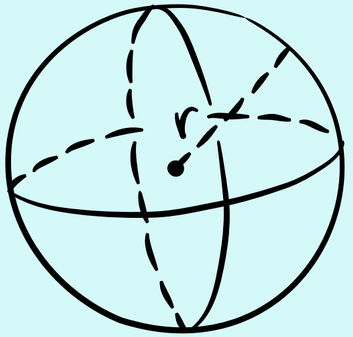
Reference point

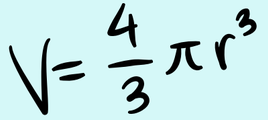
By setting a reference point it is possible to determine two directions or orientations.











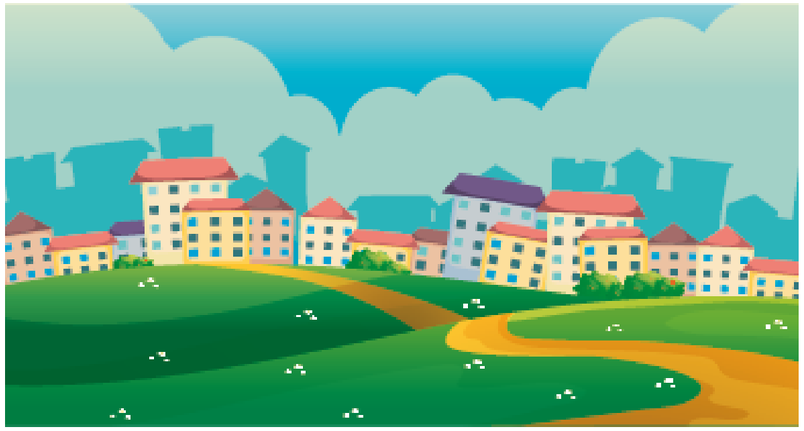
Reference point

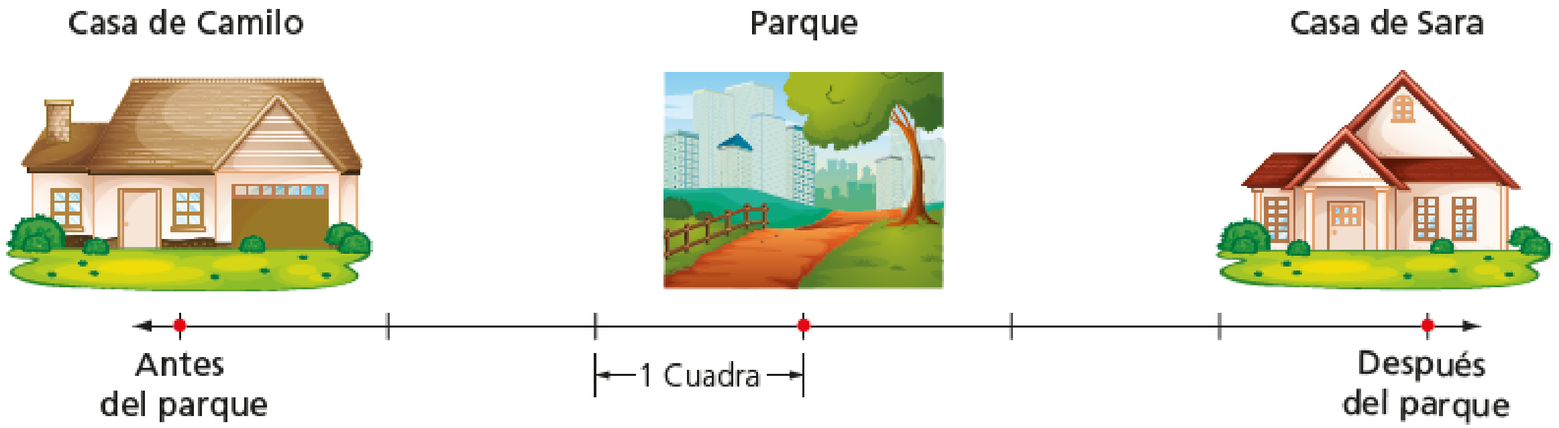
Examples

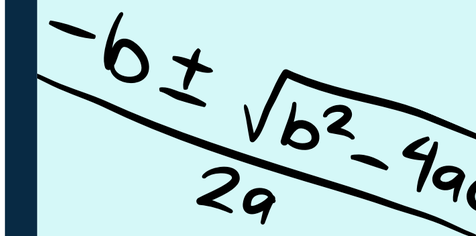
Camilo and Sara live on the same street where there is a park. Camilo's house is three blocks before the park, and Sara's house is three blocks after the park.

Reference point

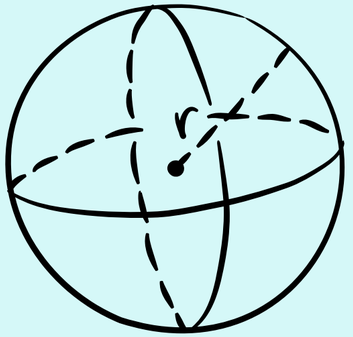
How are the positions of Camilo's and Sara's houses in relation to the location of the park?







$y = mx + b$



$V = \frac{4}{3}\pi r^3$

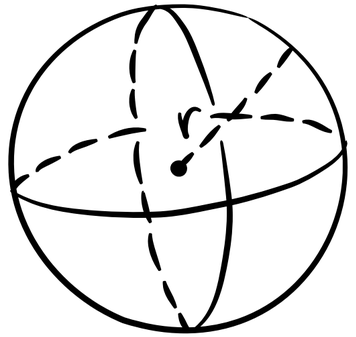
Relative numbers

Numbers that indicate a quantity with respect to a reference point are called relative numbers.

- They are preceded by a plus(+) or minus (-) sign.

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y = mx + b$$



$$V = \frac{4}{3}\pi r^3$$

Relative numbers

Above - Below

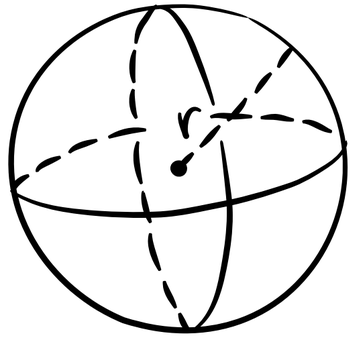
Before - After

Behind - In front

To the left - To the right

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y = mx + b$$



$$V = \frac{4}{3}\pi r^3$$

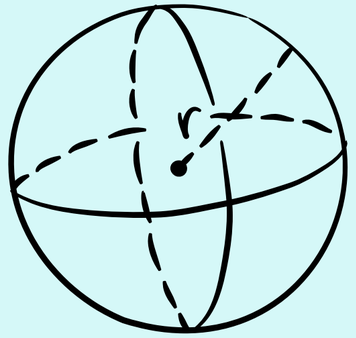
EXAMPLES

The city of Esmeraldas was founded in 1526 by Bartolomé Ruiz, the city of El Tena was founded in 1560 by Gil Ramírez Dávalos and the city of Quito was founded in 1534 by Sebastián de Benalcázar. If the year of foundation of Quito is taken as a reference point, how many years before was the city of Esmeraldas founded and how many years after the Tena?

La ciudad de Esmeraldas fue fundada en 1526 por Bartolomé Ruiz, la ciudad de el Tena fue fundada en 1560 por Gil Ramírez Dávalos y la ciudad de Quito fue fundada en 1534 por Sebastián de Benalcázar. Si se toma como punto de referencia el año de fundación de Quito, ¿cuántos años antes fue fundada la ciudad de Esmeraldas y cuántos años después el Tena?

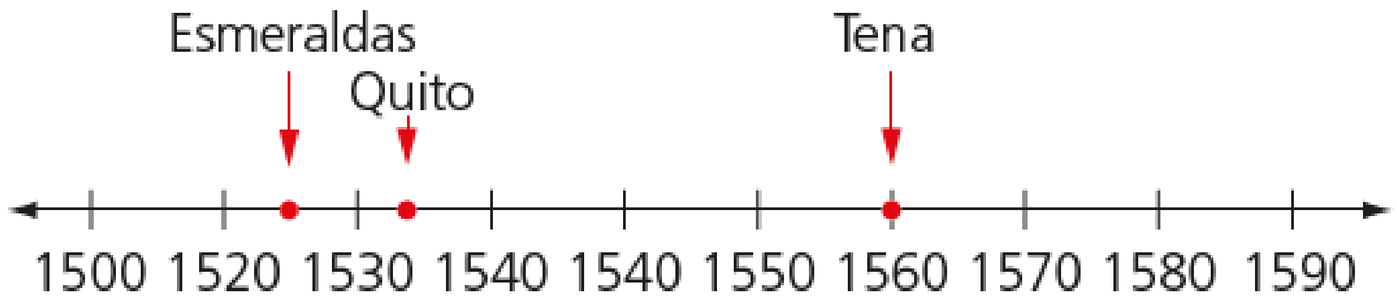
$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y = mx + b$$



$$V = \frac{4}{3}\pi r^3$$

EXAMPLES

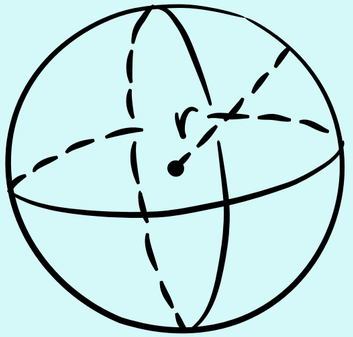


Tena was founded 26 years after Quito, a situation that can be represented by the number +26.

The numbers –8 and +26 are relative numbers.

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y = mx + b$$

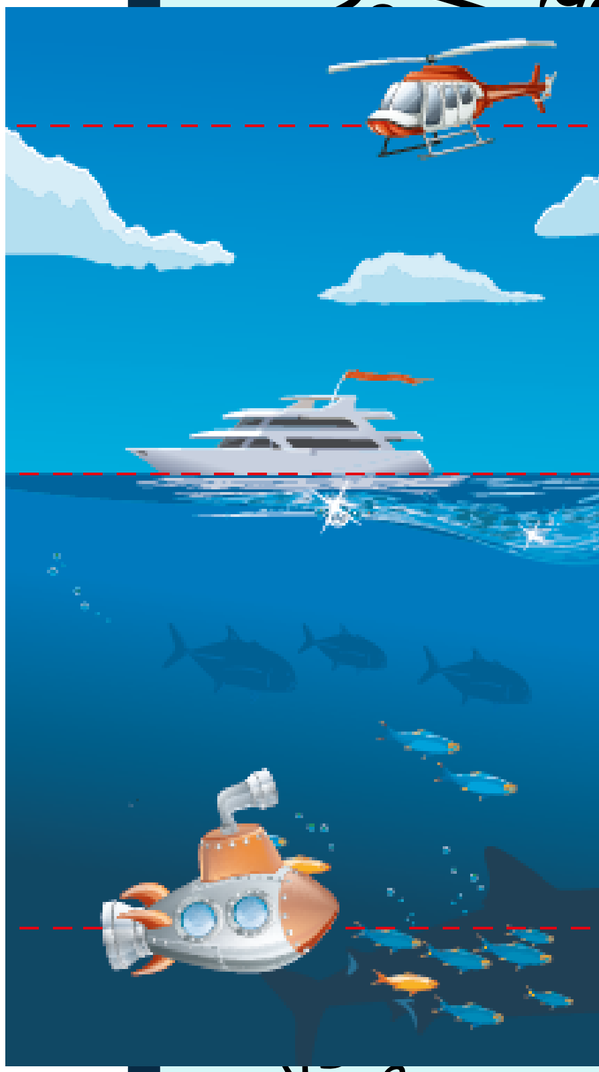


$$V = \frac{4}{3}\pi r^3$$

EXAMPLES

Figure represents the location of a helicopter and a submarine with respect to sea level. If the helicopter is 30 m above sea level and the submarine is 40 m below sea level, what are the relative numbers indicating the number of meters each vehicle is located with respect to sea level?

La Figura representa la ubicación de un helicóptero y de un submarino con respecto al nivel del mar. Si el helicóptero está a 30 m de altura y el submarino está a 40 m de profundidad, ¿cuáles son los números relativos que indican la cantidad de metros a los que se encuentra cada vehículo con respecto al nivel del mar?



EXAMPLES

SOLUTION

In this case, the reference point is the sea level; therefore, the position "30 m height" is expressed by the relative number +30 m, while the position "40 m depth" is written as -40 m.

En este caso, el punto de referencia es el nivel del mar; por lo tanto, la posición “30 m de altura” se expresa mediante el número relativo +30 m, mientras que la posición “40 m de profundidad” se escribe como -40 m.