



Mayan Pyramid Coordinates

Explore coordinate planes and how to use an x and y axis to plot points. Apply your knowledge to design a very mathematical Mayan Pyramid!

TEKS:

MATH 5.8: Geometry and measurement. The student applies mathematical process standards to identify locations on a coordinate plane.

MATH 5.8 A: The student is expected to describe the key attributes of the coordinate plane.

MATH 5.8 B: The student is expected to describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane

MATH 6.11: Measurement and data. The student applies mathematical process standards to use coordinate geometry to identify locations on a plane. The student is expected to graph points in all four quadrants using ordered pairs of rational numbers.

Materials:

- Graph paper
- Markers
- Pencil
- Ruler

STEM Explanation:

The Maya built some of the largest pyramids in the world, and they did so without the use of metal tools, the wheel, or pack animals! These pyramids were built around 3,000 years ago as temples or burial places, often in the center of their cities. Instead of straight sides, most Mayan pyramids had steps, or stairways, on the side, but architecture varied between regions and time periods. There are Mayan pyramid ruins in many different cities in Mexico. The largest Mayan pyramid is the Great Pyramid of Cholula. If someone asked you: where *exactly* is the Great Pyramid of Cholula located, how would you respond? You could say "it is located in the city of Cholula, which is located in the state of Puebla in Central Mexico." You could even tell someone its street address or nearby landmarks. However, one way to give an exact location of the Great Pyramid of Cholula would be to tell someone its geographical coordinates: 19°03'16.20" N, -98°18'4.20" W.

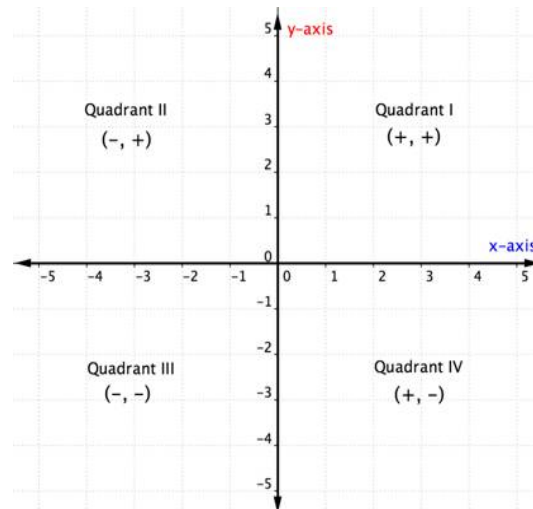
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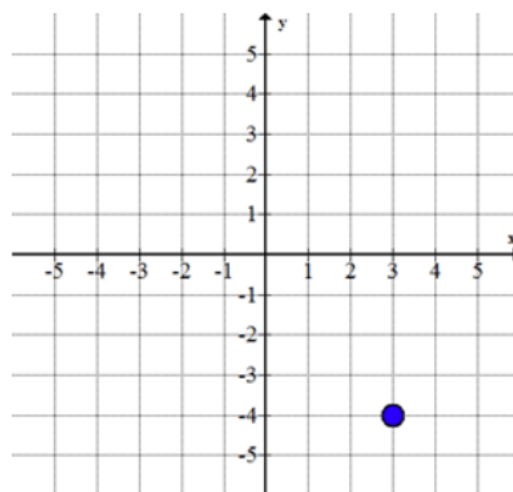
Coordinates are numbers that describe an exact position on a graph or a map. A coordinate plane is a two-dimensional plane formed by the intersection of a horizontal line (called the x-axis) and a vertical line (called the y-axis). The point at which these two lines intersect is called the origin. Four squares are created with this intersection, known as quadrants. The quadrants are numbered I, II, III, and IV (1-4 in roman numerals) and go counterclockwise, with Quadrant I being in the top right.

Check out the coordinate plane below! As you can see, the horizontal line is labeled “x” for the x-axis, and the vertical line is labeled “y” for the y-axis. Numbers on the x-axis to the right of the y-axis are positive, while numbers on the x-axis to the left of the y-axis are negative. Numbers on the y-axis above the x-axis are positive, while numbers on the y-axis below the x-axis are negative.



Note: The numbers on the x-axis and y-axis don't have to stop at 5. They can go to infinity!

Now, how could we describe the location of the blue dot on the coordinate plane below? We could say it's in the bottom right corner (Quadrant 4), but remember: we're trying to describe its exact location!



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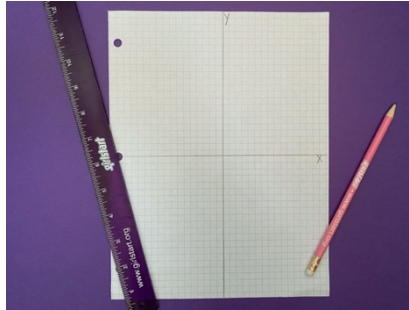
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We can describe the blue dot using an ordered pair, or coordinates! When writing coordinates, we always write the number on the x-axis first, followed by a comma, and then the number on the y-axis. Like this: (x,y). Just like the alphabet, we use x first then y. For the blue dot above, we move along the x-axis to 3, then move down the y-axis to -4. The coordinates for the blue dot are (3, -4). Now that you know how coordinates work, you are ready to plot a Mayan Pyramid on a coordinate plane!

How To:

1. Take out a sheet of graph paper and use a pencil and ruler to turn it into a coordinate plane. Label the horizontal line "x" and the vertical line "y" to act as your x and y axes.



2. Use a pencil to draw a dot at each of the following coordinate locations:

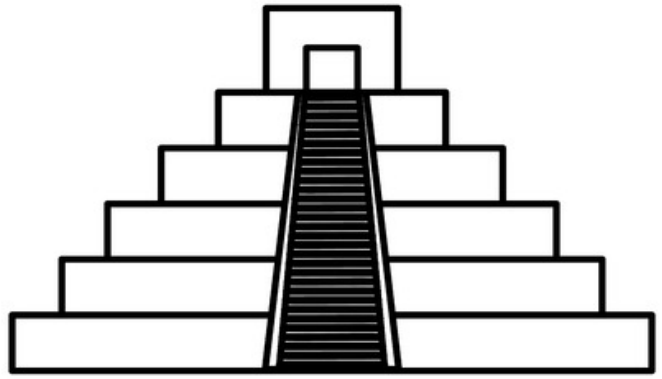
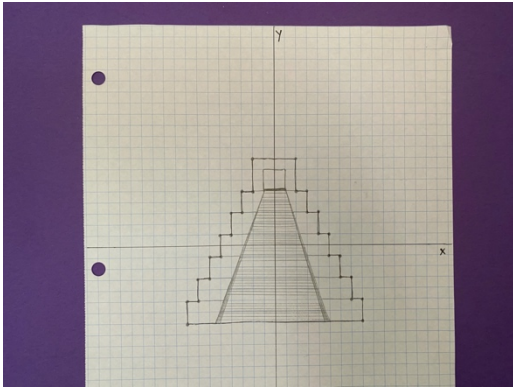
Quadrant I	Quadrant II	Quadrant III	Quadrant IV
(2, 8)	(-2, 8)	(-5, -1)	(5, -1)
(2, 5)	(-2, 5)	(-6, -1)	(6, -1)
(3, 5)	(-3, 5)	(-6, -3)	(6, -3)
(3, 3)	(-3, 3)	(-7, -3)	(7, -3)
(4, 3)	(-4, 3)	(-7, -5)	(7, -5)
(4, 1)	(-4, 1)	(-8, -5)	(8, -5)
(5, 1)	(-5, 1)	(-8, -7)	(8, -7)

3. Use a pencil to connect the dots to create a Mayan Pyramid shape! Draw in additional features to help your pyramid shape look more realistic, then use markers to decorate. Check out the photos below if you need help or inspiration.

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Career Connection:

Mathematicians use mathematical theory, computational techniques, algorithms, and the latest computer technology to solve economic, scientific, engineering, and business problems. They think logically and creatively to solve and express mathematical problems across many different fields.

Resources:

https://www.123rf.com/clipart-vector/pyramid_mayan.html?sti=laljvh6rjwytqyq84pl

http://www.montereyinstitute.org/courses/DevelopmentalMath/COURSE_TEXT2_RESOURCE/U13_L1_T1_text_final.html

<https://www.splashlearn.com/math-vocabulary/geometry/coordinate-plane>

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