



Helping With Math

Distance Formula of Two Points



GRADE 6



Distance between two points can be determined by checking the coordinates of the ordered pair plotted in the graph. This formula has been derived from the Pythagorean Theorem.

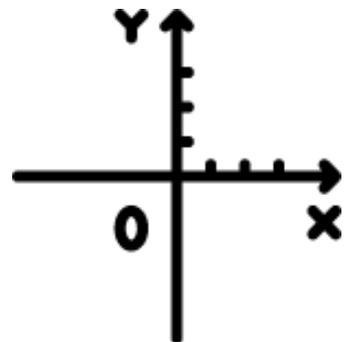
For horizontal lines and vertical lines, the distance is determined by checking their difference.



This is your Captain, speaking! We are about to reach our destination. Before that, let's study first!

In identifying the distance of two points, you need to have the coordinates of the ordered pairs as plotted in the graph. The coordinates of the points are composed of two numbers each that signifies their location in the graph.

Example: (4, 1); (3, 5)

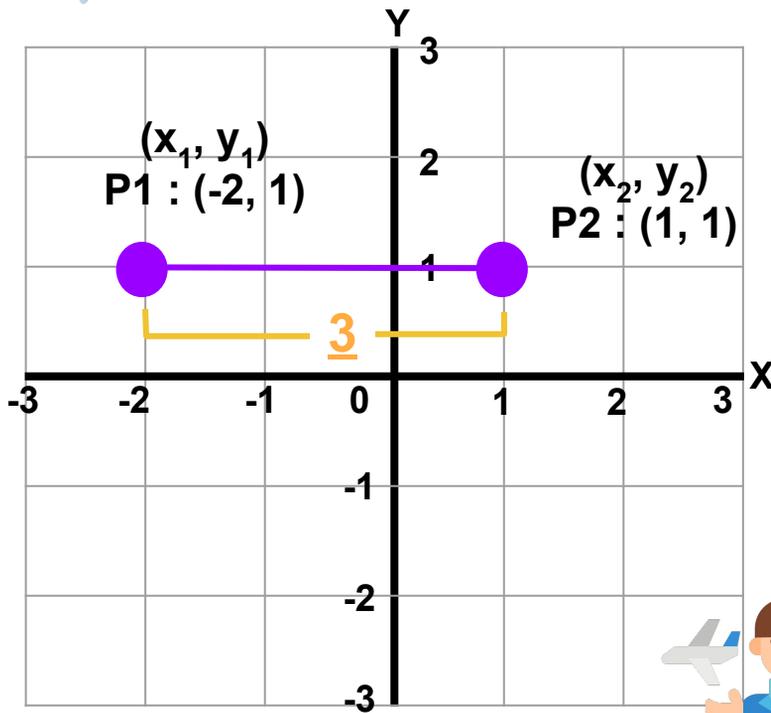


FORMULA AND PROCESS

REMEMBER!



$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$



For horizontal and vertical lines, only the difference in the x and y coordinates, are needed in order to determine the distance between two points.



Solving for the distances can sometimes yield a negative sign due to the position of points on the cartesian plane. But don't worry, squaring the distances will remove any negatives, showing its absolute number.

Example:

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$= \sqrt{(-2-1)^2 + (1-1)^2} \quad \leftarrow \text{Substitute the given coordinates.}$$

$$= \sqrt{(-3)^2 + (0)^2} \quad \leftarrow \text{Subtract the coordinates.}$$

$$= \sqrt{9 + 0} \quad \leftarrow \text{Square the coordinates from the subtracted answers.}$$

$$= \sqrt{9} \quad \leftarrow \text{Add the given numbers.}$$

$$= 3 \quad \leftarrow \text{Find the square root to get the final answer.}$$



FORMULA AND PROCESS

Let us try to apply below what you have learned. From the given coordinates of each points, find the distance of the two points by using the Distance Formula.



Don't forget to identify x's and y's first!

Show your solution here:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Given:

$(-1, -1); (-1, 2)$

Show your solution here:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

You may use a graph to guide you!



Given:

$(3, 1); (2, 1)$



TABLE OF ACTIVITIES

1. Auto-Pilot
2. Which of the Countries
3. Around the World
4. Stop the Plane
5. Correct the Route
6. The Delayed Flight
7. First Flight
8. Learn the Flags
9. Help the Pilot
10. Can I Board the Plane?



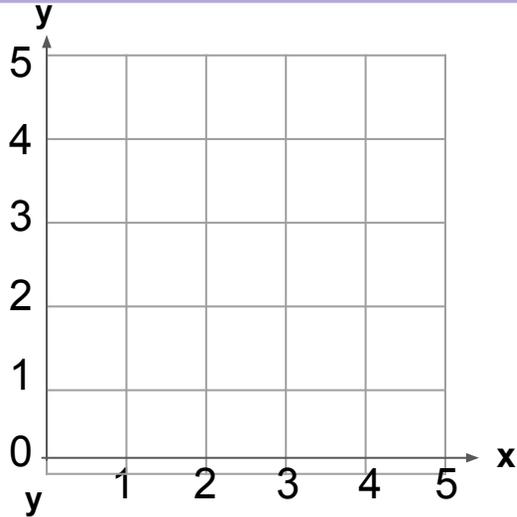
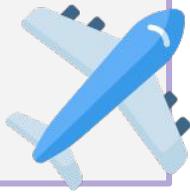
AUTO-PILOT

The planes are on auto-pilot. To facilitate a successful landing, you have to answer the following. Plot the points and choose the letter of the correct distance of the two given coordinates.

1.

$(2, 1); (2, 5)$

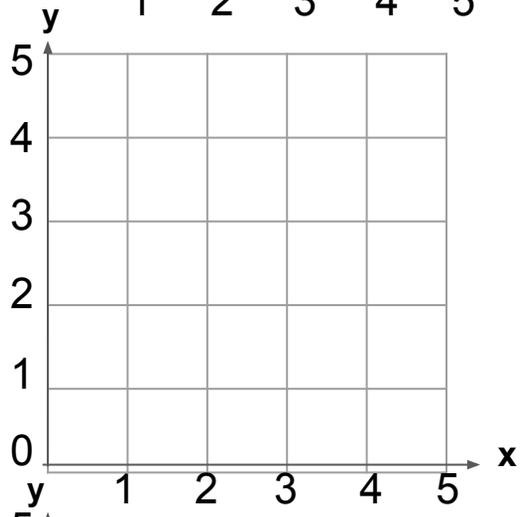
- a. 8
- b. 2
- c. 4



2.

$(3, 4); (3, 1)$

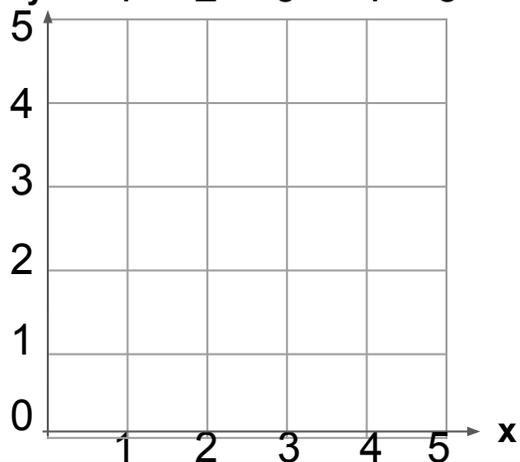
- a. 2
- b. 6
- c. 3



3.

$(4, 2); (4, 5)$

- a. 3
- b. 1
- c. 7



WHICH OF THE COUNTRIES

Help the passengers decide where they will go for a vacation by finding the distance in the box. Remember to use absolute values.



7
40



9
8



12
15



1.

$(45,26); (45,34)$

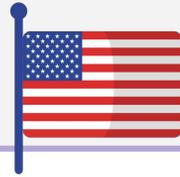
$d = \underline{\hspace{2cm}}$



2.

$(89,54); (80,54)$

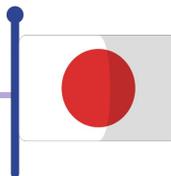
$d = \underline{\hspace{2cm}}$



3.

$(-66,-87); (-66,-75)$

$d = \underline{\hspace{2cm}}$



4.

$(15,21); (15,36)$

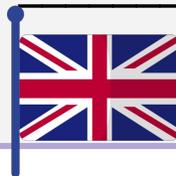
$d = \underline{\hspace{2cm}}$



5.

$(73,78); (33,78)$

$d = \underline{\hspace{2cm}}$



AROUND THE WORLD

Let's ride the airplane and travel around the world. As your plane ticket, fill in the blanks to complete the equations below. Determine the X and Y components of the distance first, then solve the total distance using the distance formula.

1. $(2, -20); (-10, -4)$

X distance =

Y distance =

$d = \sqrt{\quad + \quad}$

d = _____



2. $(-5, -4); (-10, -16)$

X distance =

Y distance =

$d = \sqrt{\quad + \quad}$

d = _____

3. $(-2, -4); (7, 8)$

X distance =

Y distance =

$d = \sqrt{\quad + \quad}$

d = _____



4. $(11, 12); (17, 20)$

X distance =

Y distance =

$d = \sqrt{\quad + \quad}$

d = _____

5. $(5, 9); (2, 5)$

X distance =

Y distance =

$d = \sqrt{\quad + \quad}$

d = _____



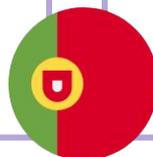
6. $(1, 8); (1, 2)$

X distance =

Y distance =

$d = \sqrt{\quad + \quad}$

d = _____



STOP THE PLANE

You are late and the plane is about to leave. To stop the plane, place $>$, $<$ or $=$ on the line provided if the distance of the given pairs are greater than, less than or equal.

1. $(13, 25)$
 $(13, 19)$

$(14, 20)$
 $(18, 24)$

4. $(100, 89)$
 $(88, 89)$

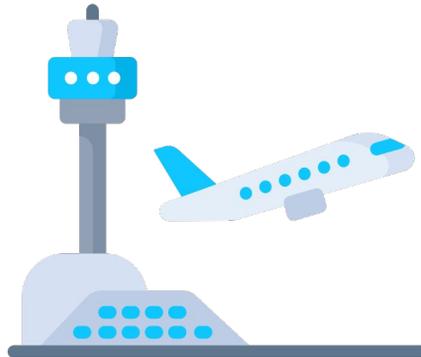
$(113, 88)$
 $(113, 85)$

6. $(-4, 23)$
 $(-4, 29)$

$(2, 14)$
 $(2, 20)$

2. $(63, 32)$
 $(63, 40)$

$(120, 100)$
 $(111, 100)$



7. $(223, 141)$
 $(230, 141)$

$(250, 156)$
 $(260, 156)$

3. $(105, 97)$
 $(120, 97)$

$(130, 91)$
 $(128, 91)$

5. $(-8, 23)$
 $(-8, 32)$

$(46, 30)$
 $(46, 40)$

8. $(69, 25)$
 $(69, 32)$

$(14, 75)$
 $(14, 82)$



CORRECT THE ROUTE

The pilot forgot his route. Help him by finding the correct answers to the equations below. Show your solutions.



$$(100, 25); (100, 75)$$
$$d = 2$$



$$(25, 15); (25, 10)$$
$$d = 7$$



$$(56, 32); (56, 24)$$
$$d = 5$$



$$(120, 97); (95, 97)$$
$$d = 17$$



$$(34, 8); (29, 8)$$
$$d = 4$$



THE DELAYED FLIGHT

The flight got delayed. Entertain the passengers by finding the distance between the given coordinates. Show your solutions.

1. $(50, 30); (25, 30)$



2. $(38, 17); (38, 10)$



3. $(69, 65); (54, 65)$



4. $(145, 85); (137, 85)$



FIRST FLIGHT

It is the flight attendant's first flight and she wants to choose her first itinerary. Help her decide on the country by solving the problems below.



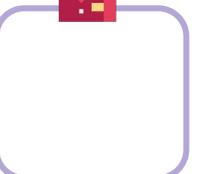
If China is represented by $(25, 22)$ and Japan is $(25, 13)$, how far are the two countries away from each other?



Philippines has coordinates of $(35, 70)$ while Singapore has coordinates of $(35, 85)$. How far are they from each other?



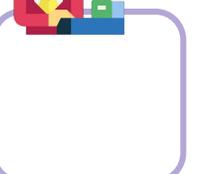
The coordinates of Italy is $(150, 110)$ and Dubai is $(150, 90)$. How far is Italy from Dubai?



The itinerary of Flight 3231 is from Malaysia to Thailand, with coordinates of $(69, 17)$ and $(61, 17)$ respectively. How far are the two countries from each other?



$(75, 32)$ is for USA, while $(87, 32)$ is for Australia. Using the given coordinates, find the distance between the two countries from each other.

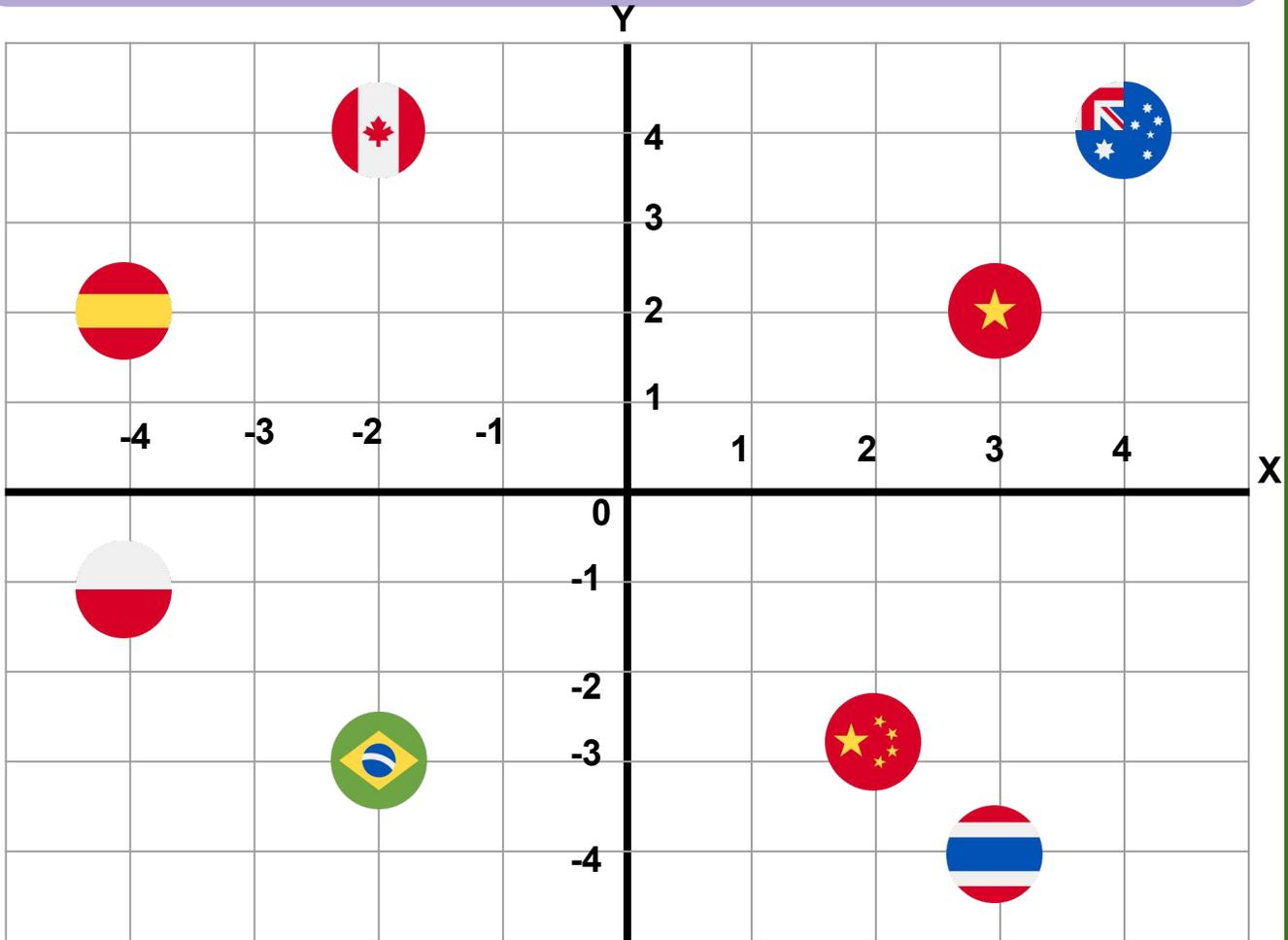


New Zealand has coordinates of $(65, 27)$ and Austria has coordinates of $(51, 27)$. How far is New Zealand from Austria?



LEARN THE FLAGS

To be a pilot, you need to learn about the flags of the countries. Identify the flags of the countries and its coordinates and answer what is being asked below.



Distance between Brazil and China

Distance between Spain and Poland

Distance between Vietnam and Thailand

Distance between Australia and Canada

Distance between Brazil and Canada



HELP THE PILOT

The pilot seems to be looking for something. Can you help him by providing the coordinates being asked below?

5 pairs of coordinates with
a distance divisible by 2

Help me with
this, please!
Do you know
the answers?



5 pairs of coordinates with
a distance divisible by 3

5 pairs of coordinates with
a distance divisible by 4

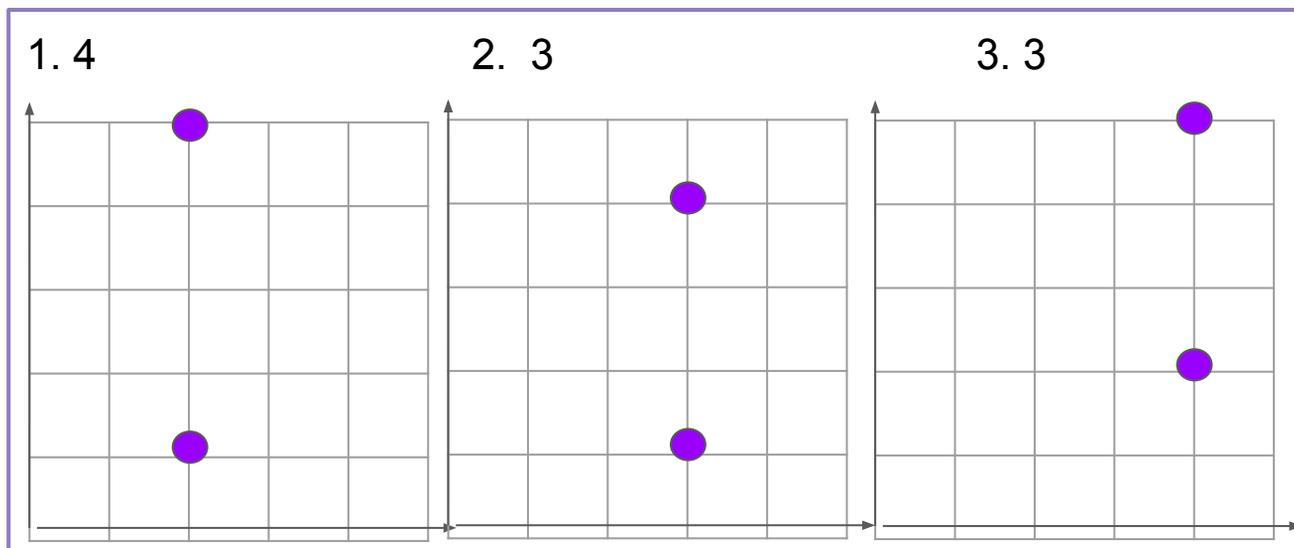
5 pairs of coordinates with
a distance divisible by 5

5 pairs of coordinates with
a distance divisible by 6



ANSWER GUIDE

Activity 1



Activity 2

1. 8 2. 9 3. 12 4. 15 5. 40

Activity 3

1. X distance = 12
Y distance = 16

$$d = \sqrt{12^2 + 16^2}$$
$$d = 20$$

2. X distance = 15
Y distance = 20

$$d = \sqrt{15^2 + 20^2}$$
$$d = 25$$

3. X distance = 9
Y distance = 12

$$d = \sqrt{9^2 + 12^2}$$
$$d = 15$$

4. X distance = 6
Y distance = 8

$$d = \sqrt{6^2 + 8^2}$$
$$d = 10$$

5. X distance = 3
Y distance = 4

$$d = \sqrt{3^2 + 4^2}$$
$$d = 5$$

6. X distance = 0
Y distance = 6

$$d = \sqrt{0^2 + 6^2}$$
$$d = 6$$



ANSWER GUIDE

Activity 4

1. > 2. < 3. > 4. > 5. < 6. = 7. < 8. =

Activity 5

1. 50 2. 5 3. 8 4. 25 5. 5

Activity 6

1. 25 2. 7 3. 15 4. 8

Activity 7

1. 9 2. 5 3. 20 4. 8 5. 12 6. 14

Activity 8

1. 4 2. 3 3. 6 4. 6 5. 7

Activity 9

Answers may vary.

Activity 10

Answers may vary.



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