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UNIT 3 LESSON 11

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| AIM: | SWBAT find distance on the coordinate grid |

**THINK ABOUT IT!**

For each given pair of coordinate pairs below, do the following:

* + - * Plot both points on the coordinate grid provided.
			* Use two different strategies to find the distance between the points
1. (5, -5) and (5, -2)



1. (-3, 4) and (2, 4)



**Test the Conjecture**

*Test the Conjecture #1)* What is the distance between (-3, -6) and (-7, -6)?

*Test the Conjecture #2)* What is the distance between (-20, -35) and (-20, 42)?

Conjecture

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| The distance between points with the same x- or y-coordinate can be found by subtracting or adding the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the coordinates that are different.  |

**PARTNER PRACTICE**

CFS for top quality work

* + Problem is annotated for meaning
	+ Same or different quadrant is identified
	+ Distance is represented with an expression
	+ Expression is evaluated

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| *Bachelor Level* |

1. What is the distance between (-4, 0) and (5, 0)? Write an expression using absolute value to represent how you found the distance between the two points
2. What is the distance between (0, -6) and (0, -11)? Write an expression using absolute value to represent how you found the distance between the two points
3. What is the distance between (-3, 3) and (-3, -5)? Write an expression using absolute value to represent how you found the distance between the two points

Explain how your expression for problem 3 helps you find the distance between the points.

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|  *Master Level* |

1. Consider the points $(-12.5, 2\frac{1}{2})$ and $(-12.5, -3\frac{3}{4})$.
2. What do the ordered pairs have in common, and what does that mean about their location in the coordinate plane?
3. Find the distance between $(-12.5, 2\frac{1}{2})$ and $(-12.5, -3\frac{3}{4})$.
4. Edwin thinks that the distance between (-7, -10) and (2, -10) can be found using the expression |7| - |2|. Is he correct? How do you know?

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**INDEPENDENT PRACTICE**

CFS for top quality work

* + Problem is annotated for meaning
	+ Same or different quadrant is identified
	+ Distance is represented with an expression
	+ Expression is evaluated

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| *Bachelor Level* |

1. Find the lengths of the line segments whose endpoints are given below. Write an expression using absolute value to represent the length of each line segment.
2. $(-3, 4)$ and $(-3, 9)$
3. $(2, -2)$ and $(-8, -2)$
4. $(0,-11)$ and $(0, 8)$
5. Can you apply the same strategy you used for parts a-c of problem 1 to find the distance between (-4, -6) and (2, 3)? Why?

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| *Master Level* |

1. What is true about the relationship between $(-3.25, 3.06) $and $\left(-3.25, 5.3\right)$? Select all that apply.

a. They are in the same quadrant

b. They are in different quadrants

c. The following expression could be used to find the distance between them:

$$\left|5.3\right|+ \left|3.06\right|$$

d. The following expression could be used to find the distance between them:

$$\left|5.3\right|- \left|3.06\right|$$

e. The distance between them is 5.36 units

f. The distance between them is 2.24 unites

$$ $$

1. The coordinates of point *A* are (-6, 4). The coordinates of point *B* are (3, 4). Which expression represents the distance, in units, between points *A* and *B*?
2. |−6| +|3|
3. |3| - |-6|
4. |-6| + |-4|
5. |4| - |-6|
6. The coordinates of the vertices of a rectangle are (–2, 3), (4, 3), (4, –4), and (–2, –4). What are the dimensions of the rectangle?
7. 1 unit by 2 units
8. 1 unit by 6 units
9. 7 units by 2 units
10. 7 units by 6 units
11. A park planner is designing a dog park. He wants to use a metal fence to enclose the kennel at the dog park. The vertices of the fence are shown below. The units on the coordinate plane are yards.
	* + Point A (4, -4)
		+ Point B (-4, -4)
		+ Point C (-4, 3)
		+ Point D (1, 3)
		+ Point E (1, -1)
		+ Point F (4, -1)

The park planner wants to add a gate between points A and F. He will not put metal fencing on that side. What is the total number of yards of metal fencing that will be needed for the kennel at the dog park?

You may use the grid below to help you solve the problem.



Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ yards

7) What is the difference between (x, y) and (x, z)? (The coordinates are in the same quadrant).

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| *PhD Level* |

8) The coordinate grid below represents a town. Curtis’ house is at (-4, -6) and Jean’s house is at (-4, 3). Plot the points where Curtis’ house and Jean’s houses are located.



Each unit on the grid represents 1 mile. If Curtis can ride his bike at a constant rate of 12 miles per hour, how many minutes would it take Curtis to ride from his house to Jean’s house?

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EXIT TICKET**

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| Self-assessment | I mastered the learning objective today. | I am almost there.  | Need more practice and feedback. |
| Teacher feedback | You mastered the learning objective today. | You are almost there.  | You need more practice and feedback. |

Use the coordinate plane below to answer questions 1 - 3. Let each unit represent 1 mile.



Which expression can be used to determine the distance from point A to point C?

-8 + 3

|-8| + |3|

3 + -8

|-8| - |3|

Explain your selection

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1. Lauren says that the distance between points D and A is 8 miles because she evaluated the expression |6| + |2|. Joshua says that the distance between points D and A is 4 miles because he evaluated the expression |6| - |2|. Who is correct? Explain in the space below.

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1. *Include if have time.* Can you use the same strategy you used to find distance in questions 1 and 2 to find the distance between points C and B? Why?