10-3-2006

The Coordinate Plane

Miriam Santana-Valadez
The College at Brockport

Unit 1

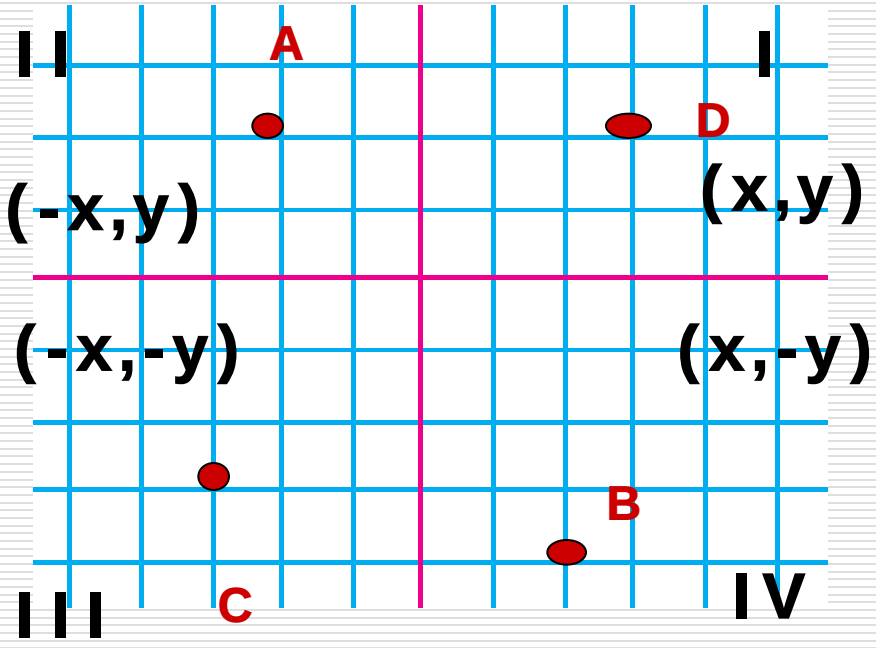
1.8 The Coordinate Plane

DO NOW 1.7 Mixed Exercises 1-6

I Complete

I Plot the points:

a) A(-2,3)
b) B(2,-4)
c) C(-3,-3)
d) D(3,2)



II Give the quadrant for the points given

A_____ C_____
B_____ D_____

III Find the sign of x and y for each quadrant

1.7 Practice

Practice 1-7: Example Exercises

1. 15 2. 18 3. 15 4. 45 5. 11 6. $x = 6, y = 150$
7. $x = 8, y = 40$ 8. $\angle 1$ and $\angle 3$, $\angle 2$ and $\angle 4$ 9. any two of the following pairs: $\angle 1 + \angle 2$; $\angle 2 + \angle 3$; $\angle 3 + \angle 4$; $\angle 4 + \angle 1$. 10. angles 1 and 2, angles 2 and 4 11. 180
12. supplementary 13. 180 14. supplementary
15. Let $m\angle 1 = m\angle 3 = x$. Then $m\angle 2 = 180 - x$ and $m\angle 4 = 180 - x$. So $m\angle 2 = m\angle 4$.

1.7 Practice

Practice 1-7: Mixed Exercises

1. 30 2. 15 3. 20 4. 6 5. 16 6. 9 7. false 8. true
9. true 10. true 11. false 12. false 13. false 14. tru
15. true 16. false 17. false 18. $m\angle PMO = 55$; $m\angle PMQ = 125$; $m\angle QMN = 55$ 19. $m\angle BOD = m\angle COE = 90$; $m\angle BOC = m\angle COD = 45$; $m\angle AOB = m\angle DOE = 45$ 20. $m\angle BWC = m\angle CWD$; $m\angle AWB + m\angle BWC = 180$; $m\angle CWD + m\angle DWA = 180$; $m\angle AWB = m\angle AWD$

Objective 1.8

- Students will find the distance between two points and the midpoint of a segment in the coordinate plane.

Essential Question

How do you find the distance between two points?
How do you find the midpoint of a segment ?

Vocabulary

- **Coordinate plane**: Plane where two number lines intersect at a 90 degree angle.
- **Quadrants:** Each one of the four sections in the coordinate plane. Named
- **X-axis**: horizontal number line.
- **Y-axis**: vertical number line
- **Ordered Pair:** Coordinates of a point on a coordinate plane. (x, y)

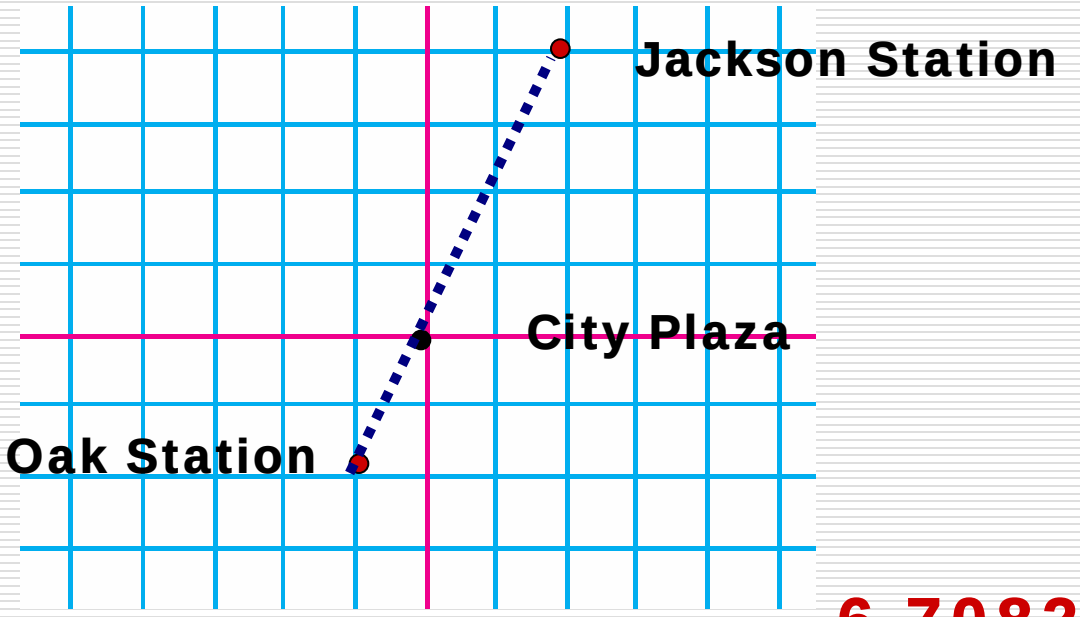
The Distance Formula

- The distance d between two points $A(x_1,y_1)$ and $B(x_2,y_2)$ is

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

Example 1 Page 54 TE

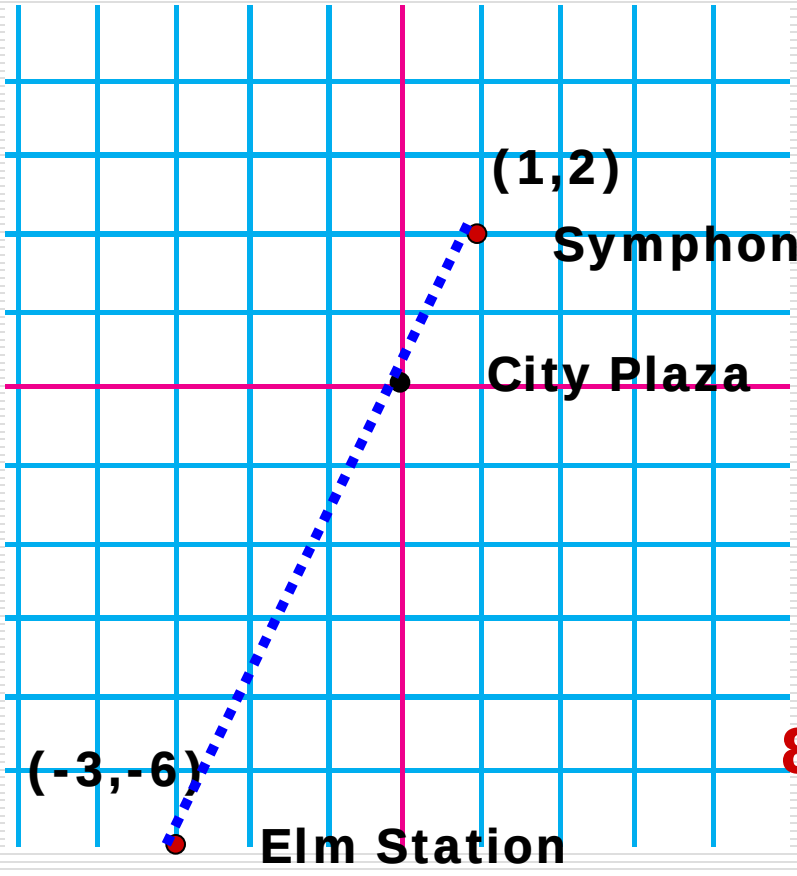
- Luisa takes the subway from Oak Station to Jackson Station each morning. Oak Station is 1 mi west and 2 mi south of City Plaza. Jackson Station is 2 mi east and 4 mi north of City Plaza. How far does she travel by subway?



6.7082 mi

Example 1b

Symphony Station is 1mi east and 2 mi north of City Plaza and Elm Station is 3 mi west and 6 mi south of City Plaza. How far is Symphony Station from Elm Station?


(1,2)
Symphony Station
City Plaza
(-3,-6)
Elm Station
8.9 mi

The Midpoint formula

The coordinates of the midpoint M of $\overline{AB}$ with endpoints $A(x_1,y_1)$ and $B(x_2,y_2)$ are the following

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

Example 2 page 55 TE

- Find the coordinates of the midpoint M of QS wit endpoints Q(3,5) and S(7,-9)

M(5,-2)

Problem 2b page 55 TE

- Find the coordinates of the midpoint M of AB with endpoints A(2,-5) and B(6,13)

M(4,4)

1.8 Practice

- TOD

Work book

Practice 1.8 Example Exercises (odd)

- Homework

Practice 1.8 Example Exercises (even)

1.8 Practice

Practice 1-8: Example Exercises

1a. $\sqrt{29} \approx 5.4$ 1b. $6\sqrt{2} \approx 8.5$ 2. $2\sqrt{10} \approx 6.3$

3. 10 4a. They are equal. 4b. x_1 5. $(\frac{1}{2}, 7)$ 6. $(0, 0)$

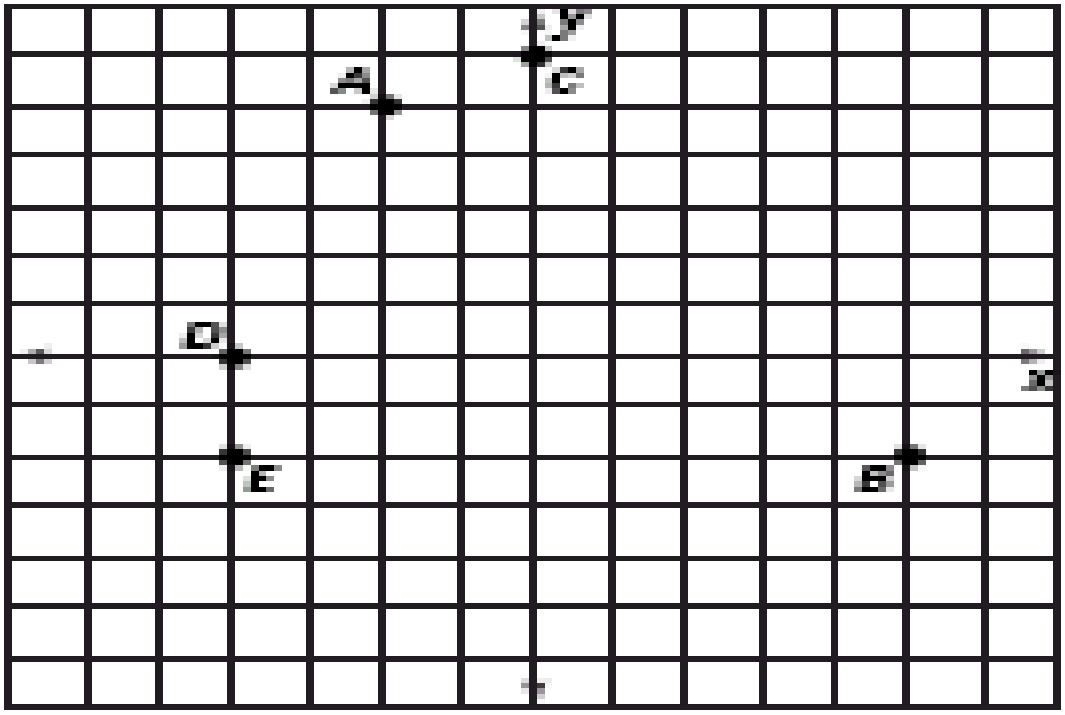
7. $(-\frac{1}{2}, 13)$ 8. $(-14, 9)$ 9. $(-\frac{1}{2}, \frac{1}{2})$ 10. $\sqrt{34} \approx 5.8$

11. $(-0.75, 4.875)$ 12. ≈ 9.76 13. $(-2.5, 3)$

14. $\sqrt{73} \approx 8.5$

Practice 1-8: Mixed Exercises

1.–5.



6. $5\sqrt{2} \approx 7.1$ 7. $2\sqrt{17} \approx 8.2$ 8. 12 9. 8 10. 12
11. $\sqrt{26} \approx 5.1$ 12. (5, 5) 13. $(\frac{1}{2}, 1)$ 14. $(10\frac{1}{2}, -5)$
15. $(-2\frac{1}{2}, 6)$ 16. (−0.3, 3.4) 17. $(2\frac{7}{8}, -\frac{5}{8})$ 18. (5, −2)
19. (4, 10) 20. (−3, 4) 21. Yes; $AB = BC = CD = DA = 6$ 22. $\sqrt{401} \approx 20.025$