

# Unit 1

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## 1.8 The Coordinate Plane

# DO NOW 1.7 Mixed Exercises 1-6

## I Complete

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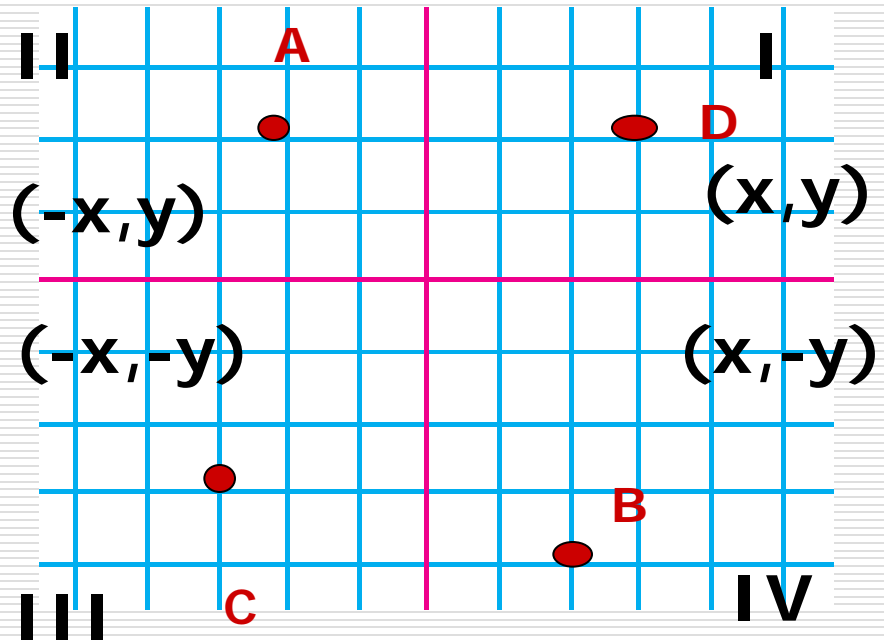
I Plot the points:

- 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

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## 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 3, 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

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## Practice 1-7: Mixed Exercises

1. 30 2. 15 3. 30 4. 6 5. 16 6. 9 7. false 8. true  
9. true 10. true 11. false 12. false 13. false 14. true  
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.  $m\angle BWC =$   
 $m\angle CWD$ ;  $m\angle ANB + m\angle BWC = 180$ ;  $m\angle CWD +$   
 $m\angle DNA = 180$ ;  $m\angle ANB = m\angle AND$

## Objective 1.8

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- 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 ?

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# Vocabulary

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- ❑ **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.  $(x, y)$
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# The Distance Formula

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

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

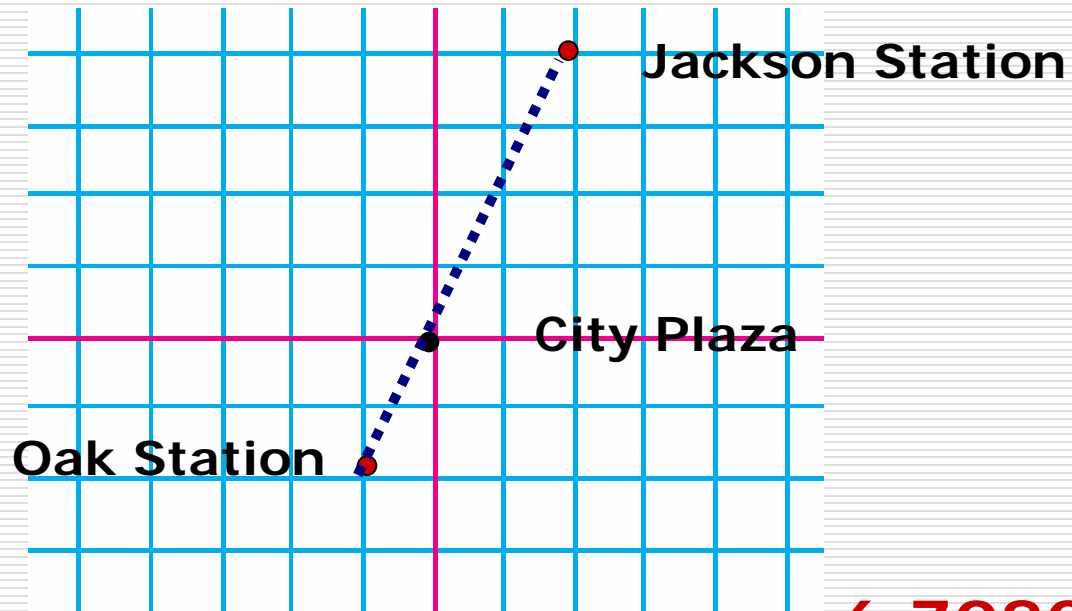
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# Example 1 Page 54 TE

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- 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?
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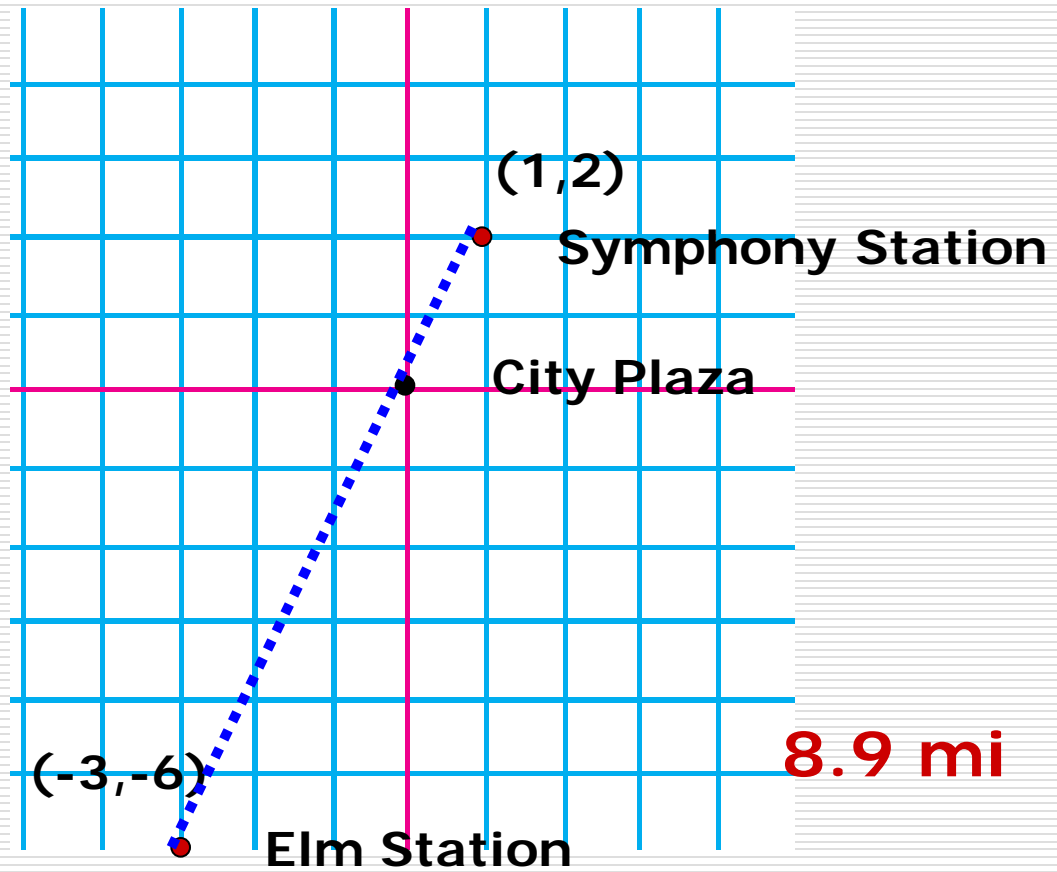
**6.7082 mi**

## Example 1b

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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?

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# The Midpoint formula

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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

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

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## Example 2 page 55 TE

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

**$M(5,-2)$**

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## Problem 2b page 55 TE

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

**$M(4, 4)$**

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# 1.8 Practice

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## TOD

Work book

Practice 1.8 Example Exercises (odd)

## Homework

Practice 1.8 Example Exercises (even)

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# 1.8 Practice

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## 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.  $\sqrt{34} \approx 5.8$

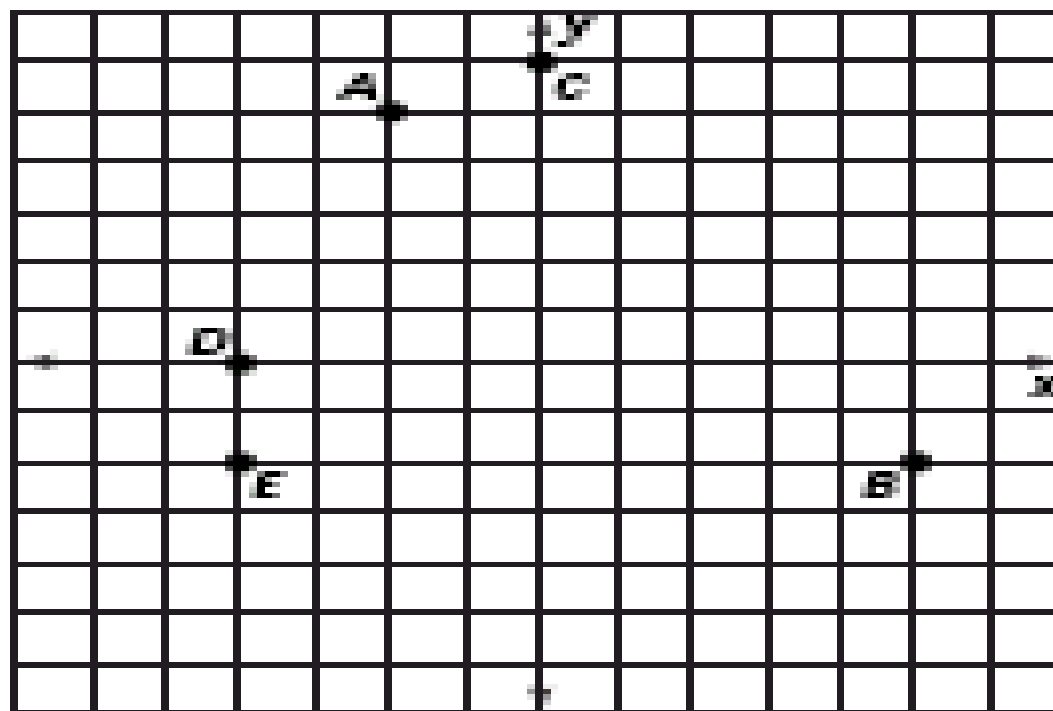
11.  $(-0.75, 4.875)$    12.  $\approx 9.76$    13.  $(-2.5, 3)$

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.  $\sqrt{401} \approx 20.025$