**Worksheet 1-8 Distance and Midpoint**

Use the distance formula or Pythagorean Theorem to find the distance of segment CD.

1) C (-3, 4), D(0, -1)

2) C(-1,8), D(4,-3)

3) C (16, 7), D(12,-3)

4) C(4, -1), D(-8,-6)

5) C (5, 10), D(5,-4)

6) C(5, -3), D(-7, 2)

Find the coordinates of the midpoint of segment AB.

7) A(3,-4), B(-3,0)

8) (-2,1), B(5,3)

9) A(3,-6), B(-9, 2)

10) A(13,-6) B(-3,-2)

11) Find the endpoint C if M is the midpoint of segment CD and M (2,4) and D(5,7).

12 ) M is the midpoint of segment AB and M is (-4,-5) and A(-2,-9). Find the other endpoint B.

13) The midpoint of segment AB is M(6, -2). A has coordinates (1, 2). Find the coordinates of B.

14) The midpoint of segment AB is M(3, 4). One endpoint is A(-3, -2). Find the coordinates of the other endpoint B.

## Finding Perimeter and Area of Rectangles & Triangles

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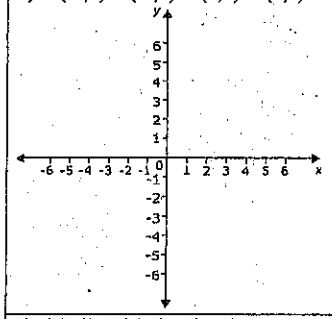
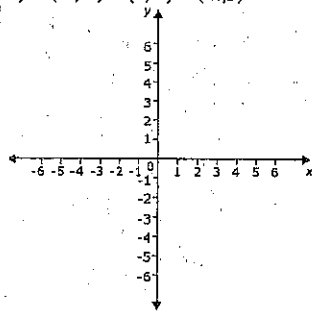
Graph the coordinate points, connect the points in order to form a polygon for each, and find the perimeter and area for the polygon.

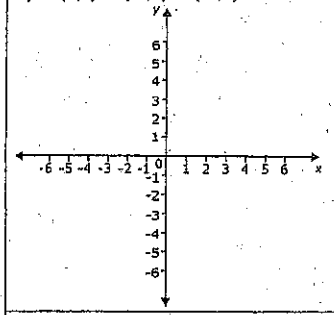
1) A(-1,1) B(-1,4) C(3,1) D(3,4)



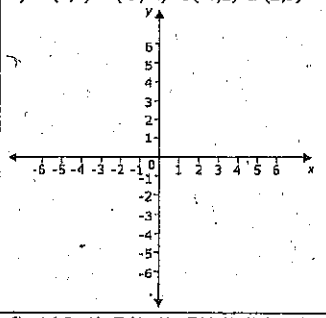
2) A(-2,-1) B(3,-1) C(-2,3)



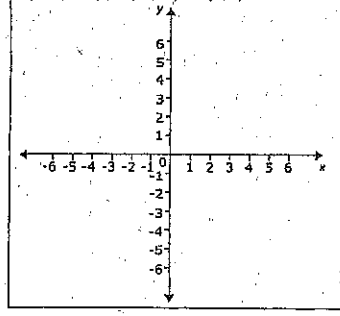
3) A(2,0) B(-3,0) C(-1,3)



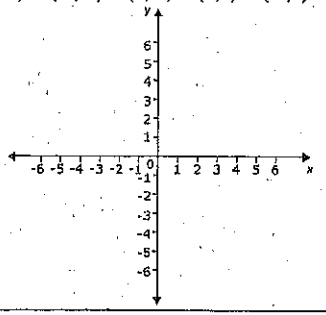
4) A(3,0) B(-3,-2) C(-4,1) D(2,3)



5) A(-1,2) B(-1,-2) C(3,0)



6) A(-3,-1) B(1,-1) C(4,1) D(-1,2)



## Equations of Parallel Lines

**Write the equation of each line in slope-intercept form.**

1. The line with slope 3 that passes through (0, 6)

2. The line with slope -4 that passes through (0, -5)

3. The line with slope -1 that passes through (3, 5)

4. The line with slope 5 hat passes through (2, -5)

5. The line parallel to y= 5x + 1 that passes through (3, 8)

6. The line parallel to y= -3x – 2 that passes through (-2, 7)

7. The line that passes through (-1, 0) and is parallel to the line through (0, 1) and (2, -3)

8. The line that passes through (3, 5) and is parallel to the line through (3, 3) and (-3, -1)

9. The line parallel to x – 3y = -12 that passes through (-3, 4)

10. The line parallel to 3x + y = 8 that passes through (0, -4)

11. Use the slope-intercept form of a linear equation to prove that if two lines are parallel then they have the same slope. (hint: use an indirect proof. Assume the lines have different slopes, $m_1$ and $m_2$. Write the equations of the lines and show that there must be a point of intersection.)

## Equations of Perpendicular Lines

**Write the equation of each line in slope-intercept form.**

1. The line perpendicular to $y = \frac{1}{2}x + 1$ that passes through (1, 4)

2. The line perpendicular to $y = -x + 2$ that passes through (-1, -7)

3. The line that passes through (1, 2) and is perpendicular to the line through (3, -2) and (-3, 0)

4. The line that passes through (-2, 3) and is perpendicular to the line through (0, 1) and (-3, -1)

5. The line perpendicular to $2y = x + 5$ that passes through (2, 1)

6. The line perpendicular to $3x + y = 8$ that passes through (0, -2)

7. ***Error Analysis*** A student was asked to find the equation of the line perpendicular to $y - 2x = 1$ that passes through the point (4, 3). The student's work is shown below. Explain the error and give the correct equation.

| The given line has slope -2, so the required line has slope ½. | |
|---|---|
| $y - y_1 = m(x - x_1)$ | *Use point-slope form* |
| $y - 3 = \frac{1}{2}(x - 4)$ | *Substitute for m, $x_1$, $y_1$* |
| $y - 3 = \frac{1}{2}x - 2$ | *Distributive Property* |
| $y = \frac{1}{2}x + 1$ | *Add 3 to both sides* |

8. Are the lines given by the equations $-4x + y = 5$ and $-x + 4y = 12$ parallel, perpendicular, or neither? Why?

9. Consider the points A (-7, 10), B (12, 7), C (10, -24), and D (-8, -3). Which two lines determined by these points are perpendicular? Explain.

## Review: Coordinate Geometry

Name:_____

**1. Find the distance between (4, 8) and (-12, 19)**

A. 4.3 units B. 10.1 units

C. 7.5 units D. 13.6 units

**2. A doctor reads coordinates off a computer screen for endpoints of a bone. The endpoints are at (-4, 2) and (2, 5). What is the length of the bone? Round your answer to the nearest tenth of a unit.**

A. 5.4 units B. 6.7 units

C. 9.2 units D. 10.0 units

**3. Find the midpoint M of XY if X is (4, -3) and Y is (105, 98).**

A. (43, 47.5) B. (50.5, 50.5)

C. (54.5, 47.5) D. (54.5, 43)

**4. A small plane needs to refuel approximately halfway to its destination. It takes off from its base located at (9, -2), on the coordinate grid and its destination is located at (-3, 8). Which of the following locations is the closest to halfway?**

A. (2.2, 2) B. (2.5, 3.5)

C. (4, 1.5) D. (5, -4.5)

**5. Which equation represents a line that is not parallel to the others?**

A. $2x - y = 3$ B. $2x - y = -5$

C. $-2x + y = -1$ D. $-2x - y = 4$

**6. Which two equations below ARE parallel with each other?**

A. $3x - y = 3$ B. $6x + 2y = -5$

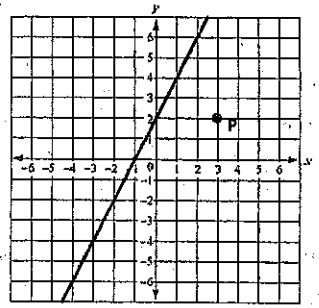
C. $-2x - y = -1$ D. $-6x + 2y = 4$

**7. An isosceles triangle has vertices at (1, 1) and (3, 3). Which of the following could be the coordinates of the third vertex?**

A. (-1, 3) B. (3, 2) C. (-1, -3) D. (5, -1)

**8. Do the following points form an isosceles triangle? Justify your answer. L(-1,1), M(2, 3), O(2, 1)**

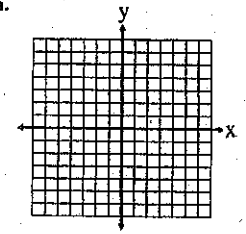
**9. What is the equation of the line parallel to line *m* that passes through point *P*?**




A. $y = -2x - 5$ B. $y = 2x - 4$

C. $y = 2x - 5$ D. $y = -2x - 4$

**10. Graph the square with vertices (3, 3), (6, 6), (9, 3) and (6, 0) and find the area.**



11. What is the area of triangle *ABC*, with *A*(5, 0), *B*(0, 5), and *C*(0, 0)?

12. What is the area of triangle *ABC*, with *A*(-1, 0), *B*(5, 0), and *C*(3, 7)?

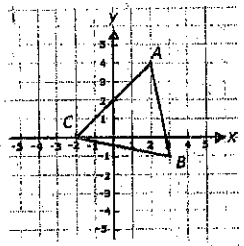
13. What is the equation of the line through the point (3, 5) that is perpendicular to the line $y = -\frac{1}{2}x + 2$?

14. What is the perimeter of $\Delta PQR$ if P is (5, 7), Q is (1, 1) and R is (-2, 6)?

15. Write an equation in slope-intercept form of the line that is perpendicular to the line with equation $y = 3x + 1$ and that passes through point *P*(6, 0). Explain your reasoning.

16. $\overline{CD}$ has endpoints *C*(1, 5) and *D*(1, -7). $\overline{EF}$ has endpoints *E*(-1, -3) and *F*(3, 1). Prove the segments have the same midpoint.

Use the figure below to answer parts questions 17-21.




17. What are the coordinates of points A, B and C?

18. Find the length of each segment.

19. Name all pairs of congruent segments.

20. Find the perimeter of $\Delta ABC$.

21. What type of triangle is $BC$ ?

22. Find the area and perimeter of the polygon below.