

## MATH 6: HANDOUT 17

### HOMEWORK

1. A point  $B$  is 5 units above and 2 units to the left of point  $A(7, 5)$ . Find coordinates of  $B$ ?
2. Find the coordinates of the midpoint of the segment  $AB$ , where  $A = (3, 11)$ ,  $B = (7, 5)$ .
3. Draw points  $A(4, 1)$ ,  $B(3, 5)$ ,  $C(-1, 4)$ . If you did everything correctly, you will get 3 vertices of a square. What are coordinates of the fourth vertex? What is the area of this square?
4. (a) 3 points  $A(0, 0)$ ,  $B(1, 3)$ ,  $D(5, -2)$  are vertices of a parallelogram  $ABCD$ . What are the coordinates of point  $C$ ?  
  
(b) 3 points  $A(0, 0)$ ,  $B(2, 3)$ ,  $D(4, 1)$  are vertices of a parallelogram  $ABCD$ . What are the coordinates of point  $C$ ?  
  
(c) 3 points  $A(0, 0)$ ,  $B(1, 5)$ ,  $D(3, -2)$  are vertices of a parallelogram  $ABCD$ . What are the coordinates of point  $C$ ?  
  
(d) Can you guess the general rule: if  $A(0, 0)$ ,  $B(b_1, b_2)$ ,  $D(d_1, d_2)$  are 3 vertices of a parallelogram, what are coordinates of point  $C$ ?

5. Consider the triangle  $\triangle ABC$  with the vertices  $A(-2, -1)$ ,  $B(2, 0)$ ,  $C(2, 1)$ . Find the coordinates of the midpoint of  $B$  and  $C$ . Find the length of the median (i.e. a median unites a vertex with the midpoint of the opposite side) from  $A$  in the triangle  $\triangle ABC$ .

6. What is the slope of a line whose equation is  $y = 2x$ ? What is the slope of a line whose equation is  $y = mx + b$ ?

7. In this problem you will find equations that describe some lines.

(a) What is the equation whose graph is the  $y$ -axis?

(b) What is the equation of a line whose points all lie 5 units above the  $x$ -axis?

(c) Is the graph of  $y = x$  a line? Draw it.

(d) Find the equation of a line that contains the points  $(1, -1)$ ,  $(2, -2)$ , and  $(3, -3)$ .

8. For each of the equations below, draw the graph, then draw the perpendicular line (going through the point  $(0, 0)$ ) and then write the equation of the perpendicular line

(a)  $y = 2x$       (b)  $y = 3x$

(c)  $y = -x$       (d)  $y = -\frac{1}{2}x$

Can you determine the general rule: if the slope of a line is  $k$ , what is the slope of the perpendicular line?







