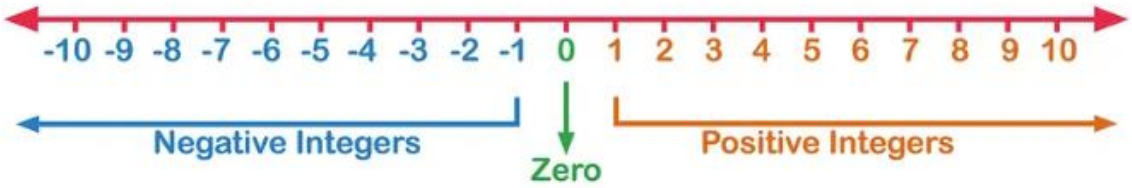
Math 4. Class Work 11

Negative numbers

- **Negative numbers** like -1 , -5 use the same notation as before but have a minus sign in front. They represent "opposite" values



- **Opening parenthesis with negative numbers**
  The "$-$" sign denotes the opposite number (switch the sign of the number in the parenthesis), and the "$+$" sign denotes the same number (keep the same sign of the number in the parenthesis). **Example:** $-(-3) = +3$ $\quad -(+3) = -3$
  $+(+3) = +3$ $\quad +(-3) = -3$

Coordinates of a point on a line

- Every number can be represented with a point on the line called an image of the number.

Example. Point A is 3 units to the right of 0 and is the image of $+3$.
Point B is 3 units to the left of 0 and is the image of -3.
The **coordinate of point A** is + 3, written as **A(+3)**, and the coordinate of point B is -3, written as B(-3).

Absolute value

- Absolute value is a property of every positive or negative number and is the distance from the number to 0 on the number line. $|a| = a \ , and \ |-a| = a$

Example: $|+2| = 2 \ , and \ |-2| = 2$

Problems:

1. Simplify by opening the parenthesis:
   $-(+10);\ +(-20);\ +(+30);\ -(-40);\ -(+7);\ -(-15);\ -(-(-20));$
2. Evaluate:

Examples: $-5 + 25;$ $8 - 16;$ $-7 - 11;$ $6 + (-14);$

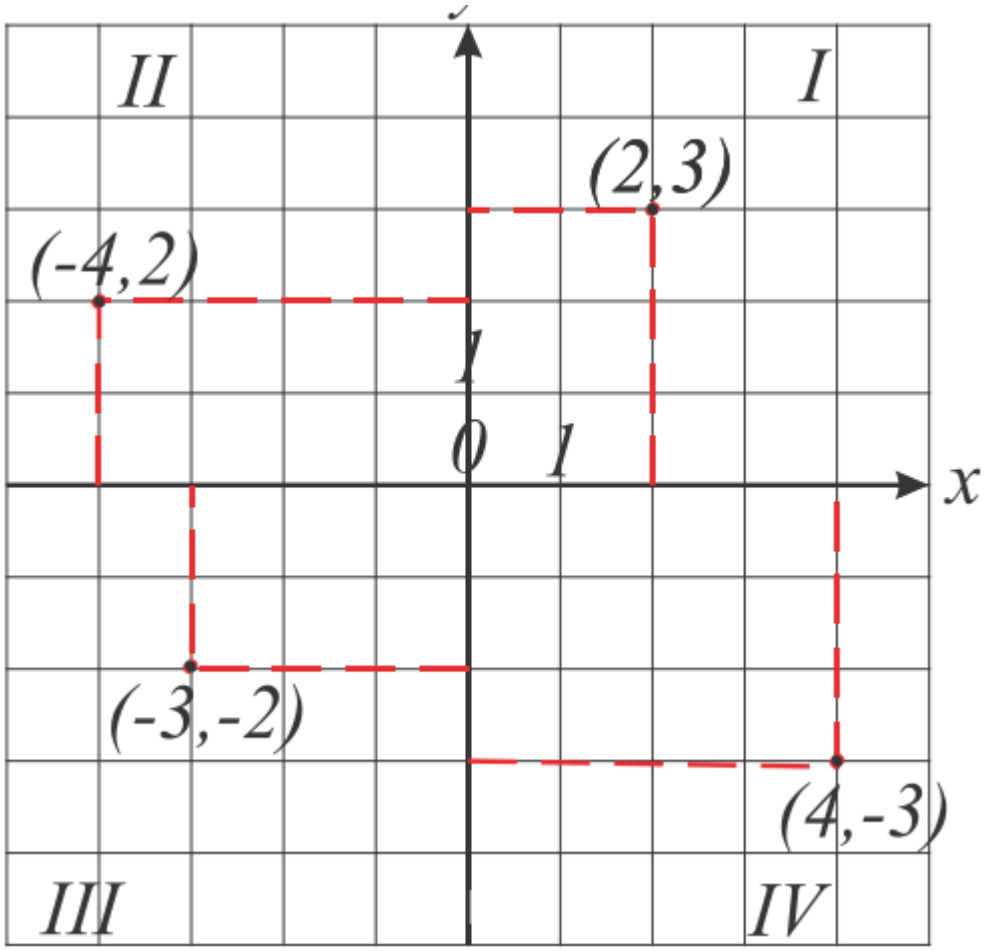
$1 - (-11);$ $-18 + 9;$ $-2 - (-6);$ $15 + (-8);$

$-6 + 6;$ $-10 - 10;$ $-5 + (-7);$ $-20 - (-2);$

Position of a point in a plane.

On a plane (imagine a map of a city), it is convenient to determine the position of a point using distances to 2 perpendicular number lines ($0x$ and $0y$)
The pair of ordered numbers (2, 3) are **the coordinates of the point**; the first is the distance to 0 on the horizontal line (the x -coordinate), the second number is the distance to 0 on the vertical line (the y – coordinate) .
The point (0,0) is called **the origin**.
The signs of these pairs of numbers (x,y) represent a **quadrant**: quadrant I - both coordinates are positive, $(+,+)$, quadrant II ($-,+$), quadrant III $(-,-)$, and quadrant IV $(+,-)$.

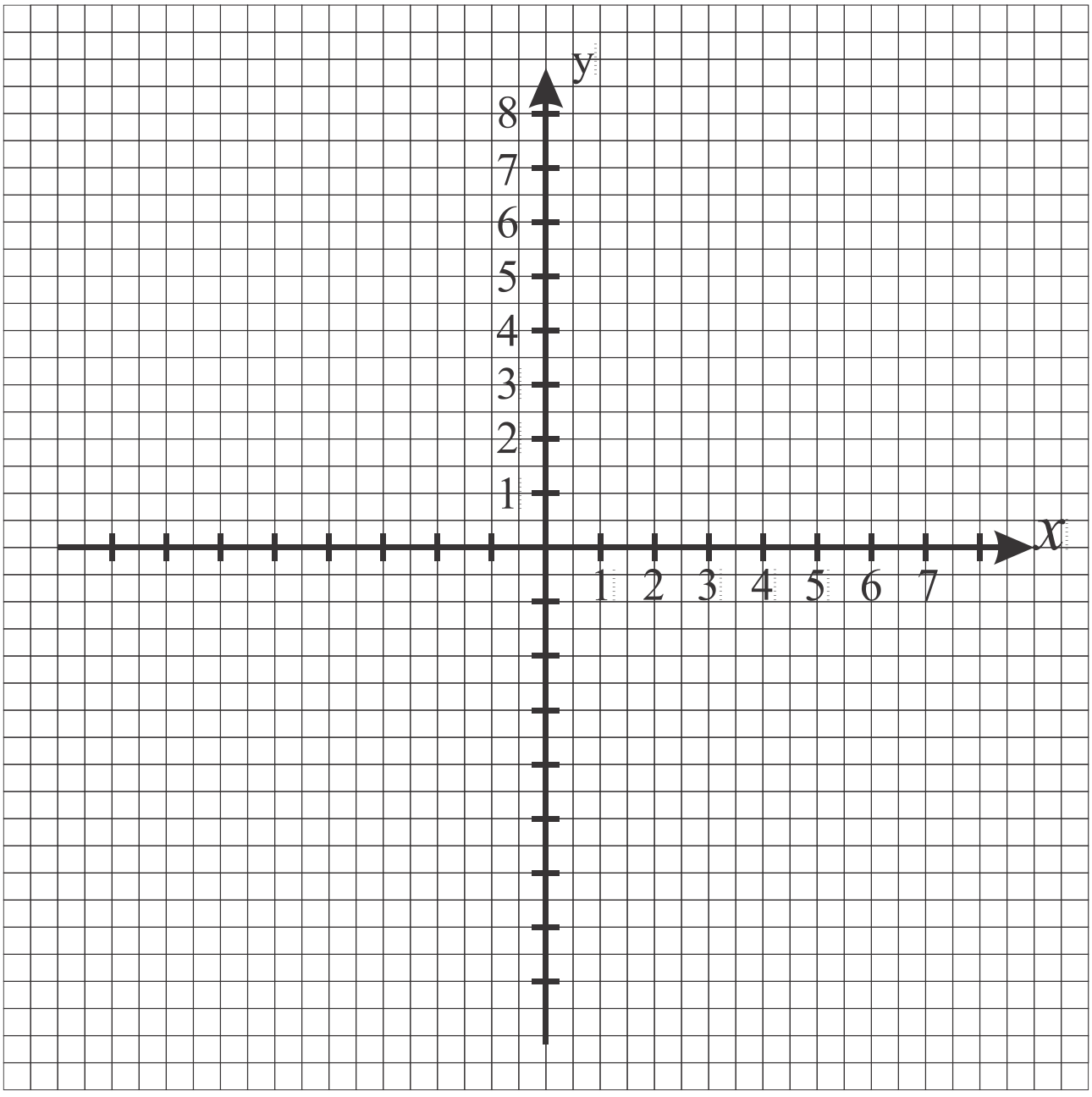
3. Label the point A(2,3) , B(4,-3), C(-4,2), D(-3,-2)
   Label point E (-1,5). Which quadrant is it in?



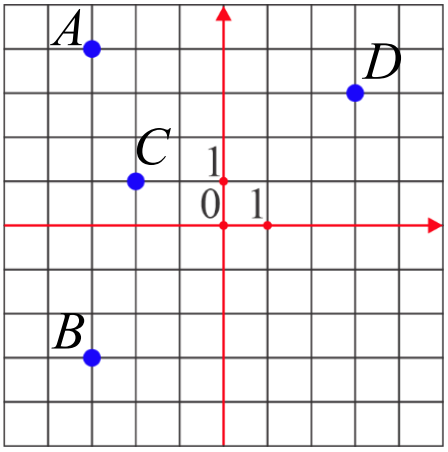
4. Using the following coordinates mark the points and connect them:

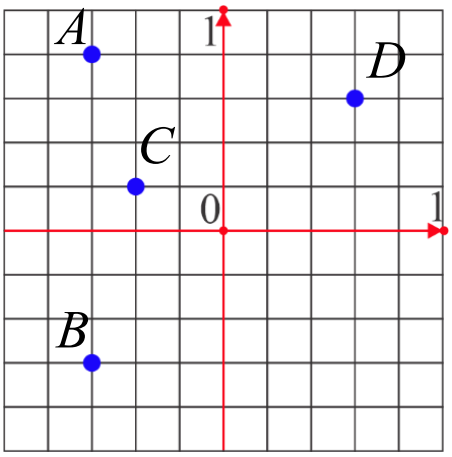
(1; -4)→(0; -4) → (1; -3) → (1; -6) → (3; -6) → (2; -5) → (3; -1) → (2; 2) → (4; 3) → (5; 4) → (3; 4) → (2; 5) → (1; 5) → (0; 6) → (0; 5) → (-1; 3) → (0; 0) → (-2; -1) → (-3; -4) → (-3; -5) →

(-4; -5) → (-5; -4) → (-6; -3) → (-5; -5) → (-3; -6) → (1; -6) eye (2; 4).

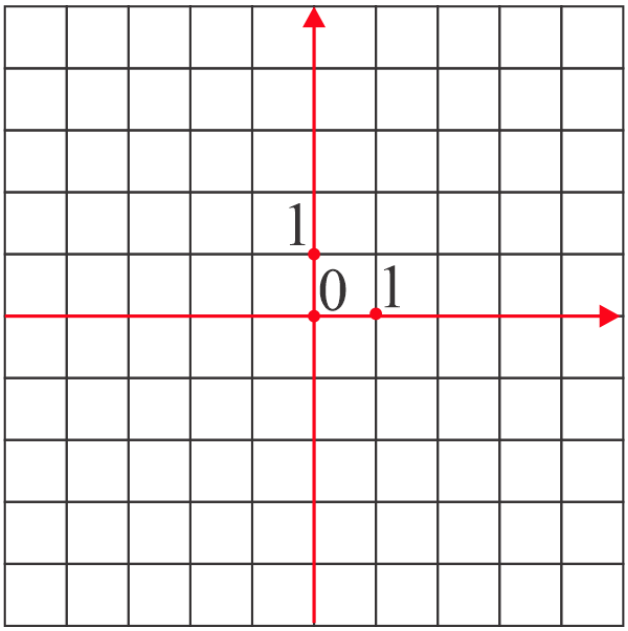


5. Find the coordinates of points A, B, C, D in two different coordinate systems:





6. Draw a shape with vertexes in points with coordinates:
   a. $(-3,2),\ (4,2),\ (4,-2),\ (-3,-2)$
   b. $(-3,4), (4,1), (0,-3)$



7. Evaluate:

   a. $(+7)\cdot(-4)$; *b.* $(-8)\cdot(-6)$; *c.* $8\cdot(-6)$;

   d. $(-7)\cdot(-4)$; *e.* $-8\cdot 6$; *f.* $5\cdot(-5)$;