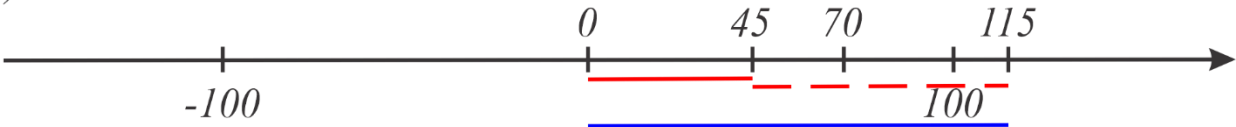Math 4d. Classwork 11.

The addition and subtraction of positive and negative numbers along the coordinate axis.

These two segments represent the absolute values of numbers 45 and 70. When we need to add 45 and 70, we can sum their absolute values and the result will be positive. Addition of two pisitive numbers produces the positive result
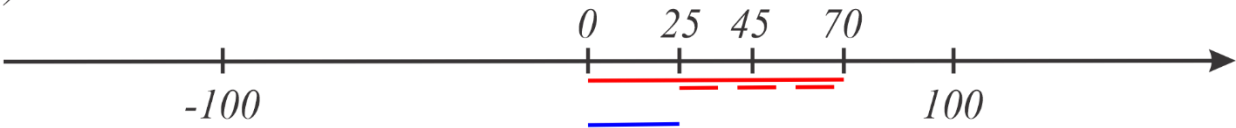
a)

.

Blue segment respresents the absolut value of the result.

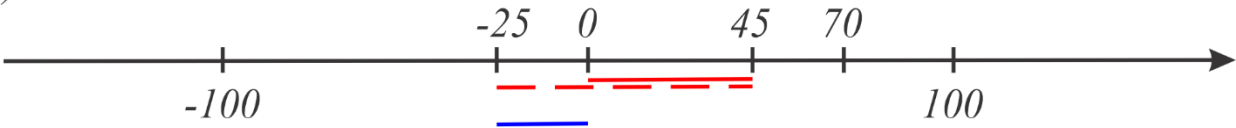$$45 + 70 = 70 + 45 = 70 - (-45) = 45 - (-70) = 115$$

b)

The result of subtraction of 45 from 70 is 25. Blue line represents the absolute value of the resalt, segment with the length equal to the difference of two other segments.

$$70 - 45 = 70 + (-45) = 25$$

c)

The result of the subtraction of 70 from 45 will be the opposite of the result of $70 - 45$. Absolut value of the result will be the same (the differens between 70 and 45) but the sign will be " $-$ "

$$45 - 70 = 45 + (-70) = -(|70| - |45|) = -25$$

So, if you need to subtract on number from the other: subtract smaller number from greater number and decide about the resulting sign.
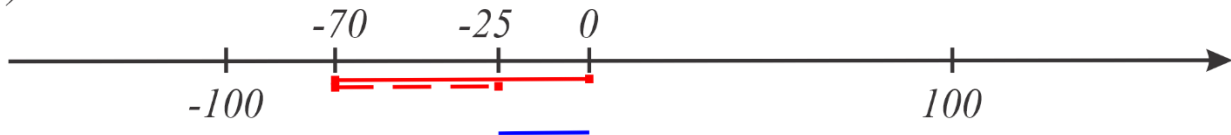
Example:

$$168 - 230;$$

$168 < 230$, we can find the difference $230 - 168 = 62$ and write " $-$ ".
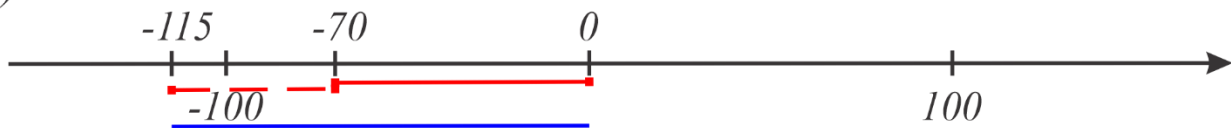
$$168 - 230 = -(230 - 168) = -62$$

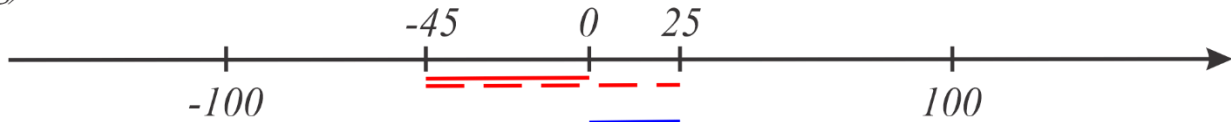Write the problems represented on the picture below:

e)

f)

g)

Coordinates.

On a plane each point corresponds to a unique ordered pair of numbers. To define these pairs, 2 perpendicular number lines are usually used. These two number lines intersect at the point called origin, associated with pair (0,0), have the same unit segment, and are called axes, usually x axis and y axis.

In this particular coordinate system, the two numbers allied with each point of the plane describe the distance from the point to both axes, and the signs of these numbers represent a quadrant where the point lies (quadrants I, II, III, and IV in the image above). Such a pair of numbers is an ordered pair, so the pair (n, m) and the pair (m, n) are linked to 2 different points. The absolute value of the first number in the pair is the distance to the *y* axis. Absolute value of the second one is the distance to the *x* axis.
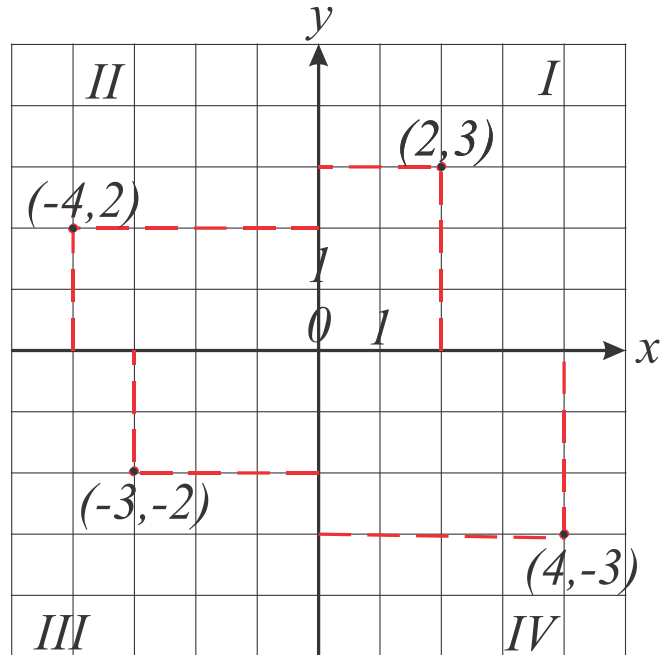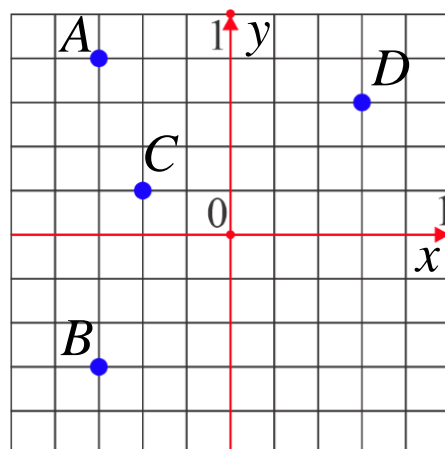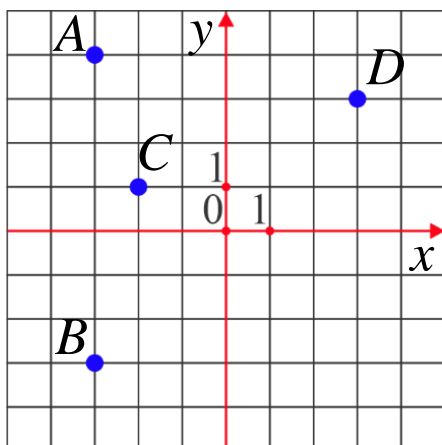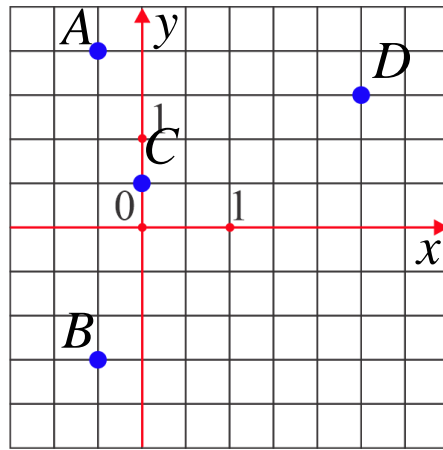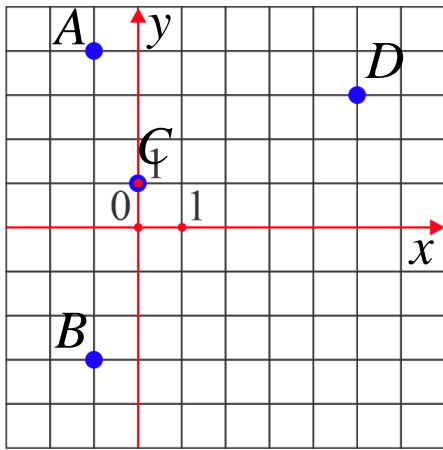
Exercises:

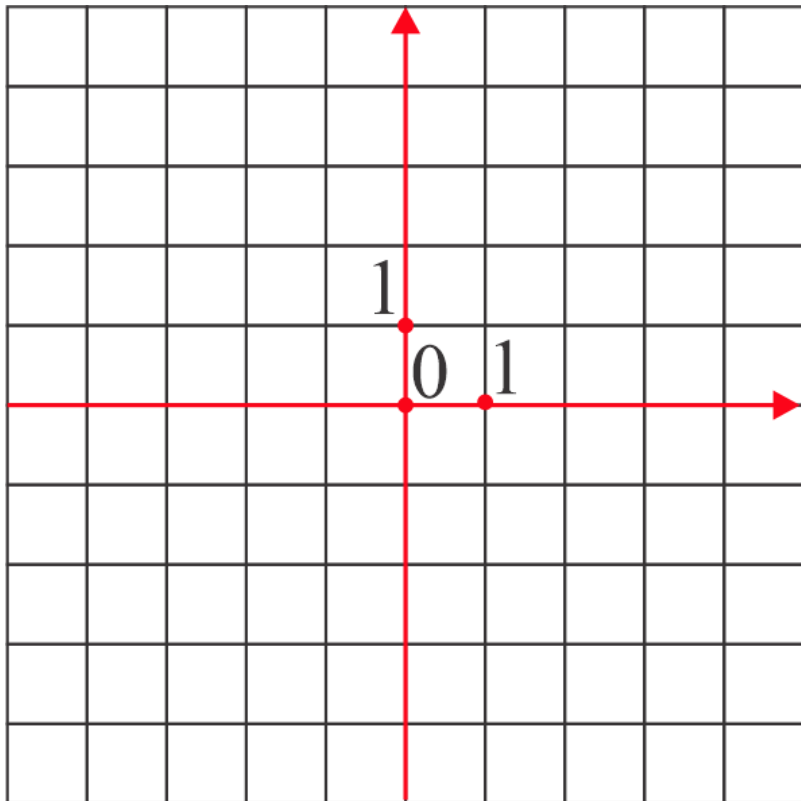1. Find coordinates of points A, B, C, D in to systems**.**
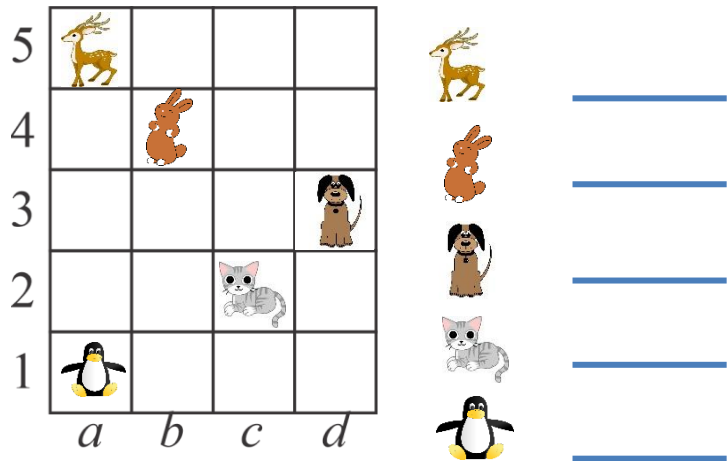
2. Find coordinates of points A, B, C, D in to systems:

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

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).