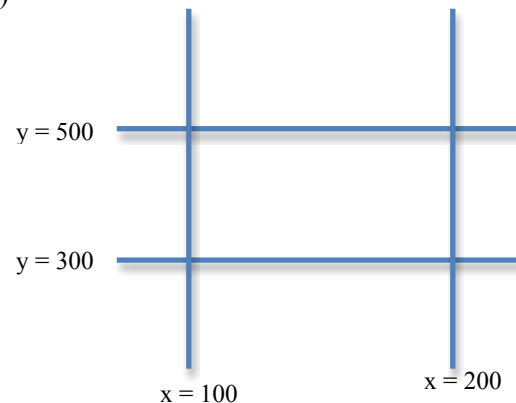


Homework 4 (Due beginning of class, Monday, Sept 24th)

1. Consider the window with the boundaries shown. Use Cohen & Sutherland's algorithm to clip the lines listed below. Show full details of the algorithm for credit. (i.e. show outcodes for end points, show results of the "or" and "and" operations, and determine the new coordinates after intersections.) Use outcodes as discussed in class i.e., (above, below, right, left). Clip the lines below:

- line segment 1: P1(150, 325), P2(175, 450)
- line segment 2: P1(250,100), P2(150, 600)



(clip from left: $A.y = P1.y + k*(W.left - P1.x)$
 from right: $A.y = P1.y + k*(W.right - P1.x)$
 from above: $A.x = P1.x + 1/k * (W.top - P1.y)$
 from below: $A.x = P1.x + 1/k * (W.bottom - P1.y)$
 k (slope) can be computed based on P1 and P2.)

2. Given a vector $a = (3, -4)$:
- the magnitude of a is _____; the normalized vector of a is _____;
- the vector perpendicular to a is _____.
3. Given vector $a = (2, 6, 1)$ and $b = (4, 2, 3)$: $a \cdot b =$ _____;
- the angle θ between the two vectors is _____; $a \times b =$ _____.
4. Show the parametric form of the line that passes through points A(3, 6) and B(2,10):
- _____.
5. How far from the line through (2, 5) and (4, -1) does the point (6, 11) lie? (textbook pg 148 practice exercise 4.3.11). Show all calculation steps involved.