Name:_____   Date:_____

Math 9/10 Honours: Section 3.7 Shoe Lace Method

1. Given the vertices, find the area of each 2D Shape using the Shoe Lace Method. Show all your work & steps:

a)	b)
$(2,7)$ $(8,2)$ $(1,1)$	$(2,6)$ $(-6,-1)$ $(3,-4)$
c)	d)
$(2,6)$ $(5,1)$ $(0,0)$	$(-2,5)$ $(4,5)$ $(-4,-2)$ $(6,-2)$
e)	f)
$(3,8)$ $(-3,5)$ $(7,3)$ $(1,1)$	$(2,6)$ $(-3,5)$ $(5,4)$ $(-5,1)$ $(4,0)$
g)	h)
$(4,8)$ $(1,5)$ $(7,5)$ $(3,2)$ $(3,-2)$	$(1,7)$ $(6,4)$ $(-3,3)$ $(-1,-1)$ $(4,-2)$

2. A triangle is created using the origin (0,0) and the coordinates of the endpoints of the given line. Use the determinant to find the area of that triangle:

a)	b)
$(1,5)$ $(8,1)$	$(1,8)$ $(4,2)$
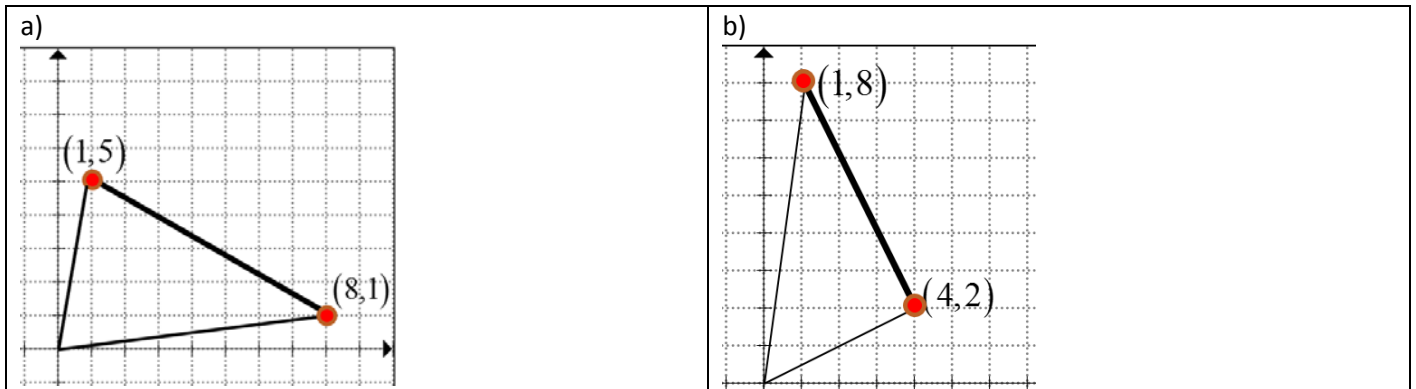
3. Using the standard xy-coordinate plane, what is the area (in square units) of a triangle whose vertices have the coordinates (0,0) , (1,5), and (7,3)?

4. A triangle has vertices $A(0,3)$, $B(4,0)$, and $C(k,5)$, where
   $0 < k < 4$. If the area of the triangle is 8, determine the value of "k":

$C(k,5)$
$A(0,3)$
O $B(4,0)$
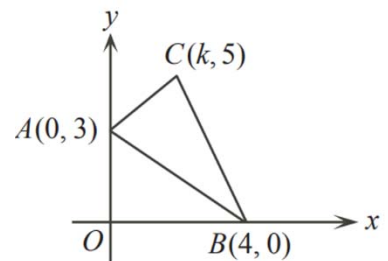
5. In the diagram, OABC is a square. A line $y = mx$ intersects CB at point "D" and cuts out 1/3 of the area of the square. What is the value of "m"?

y
D B
C
O A x
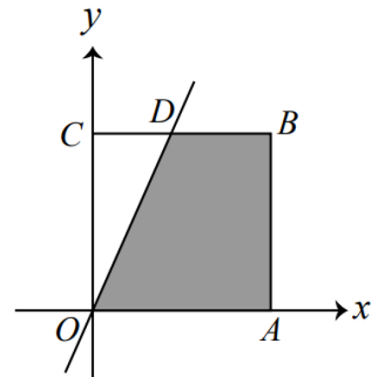
6. The three vertices of a triangle are given in the diagram. If the area of triangle is 20 units squared, then what is the value of a+b?

y
$\bullet(a,b)$
$\bullet(b,a)$
$(0,0)$ x
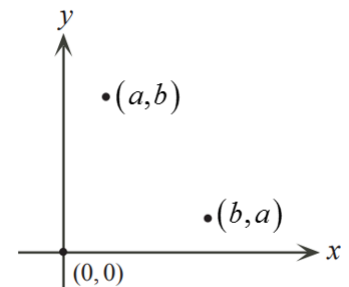
7. Triangle ABC has vertices A(0,8) , B(2,0), and C(8,0).

   a) Determine the equation of the line through "B" that cuts the triangle in half

   b) A vertical line intersects AC at "R" and BC at "S", forming triangle RSC. If the area of triangle RSC is 12.5, determine the coordinates of point "R"

   c) A horizontal line intersects AB at "T" and AC at "U", forming triangle ATU. If the area of triangle ATU is 13.5, determine the equation of the horizontal line.

8. In the diagram, "D" and "E" are midpoints of AB and BC respectively. Use the diagram to answer the following questions:
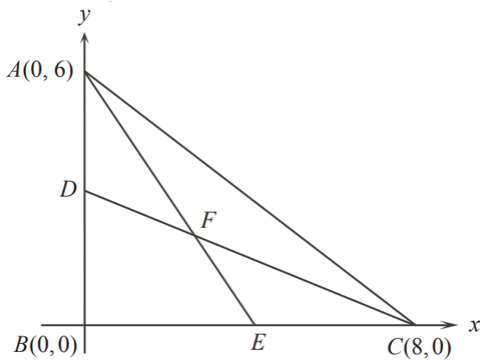
   a. Determine an equation of the line through "C" and "D"

   b. Determine the coordinates of "F", which is the intersection of AE and CD

   c. Determine the area of triangle DBC

d. Determine the area of quadrilateral DBEF:

9. In the diagram, ΔABC is right-angled. Side AB is extended in each direction to points "D" and "G" such that $DA = AB = BG$. Similarly, BC is extended to points "F" and "K" so that $FB = BC = CK$, and AC is extended to points "E" and "H" so that $EA = AC = CH$. What is the ratio of the area of hexagon DEFGHK to the area of ΔABC?
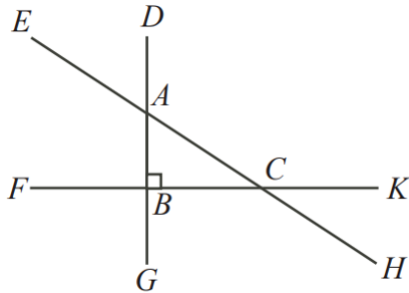
10. Challenge: There are 3 lines. The first line goes through points (-9,-2) and (12,10). The second line goes through points (0,8) and (15,2). The third line goes through points (-14,0) and (16,k). The three lines intersect and form a triangle in the middle. If the area of the triangle is 17 units², then what is the value of "k?