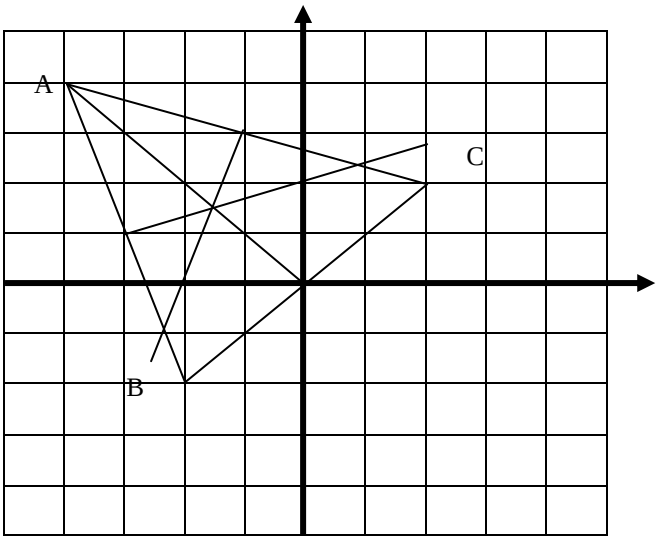
NAME.....

CO-ORDINATE GEOMETRY PROBLEMS. ANS

1.(a) Draw triangle ABC where A is (-4,4), B is (-2,-2), C is (2,2)



(b) Determine, **with clear reasons** to back up your conclusion, whether the triangle ABC is scalene, isosceles or equilateral.

$AC^2 = 6^2 + 2^2 = 40$
$AB^2 = 2^2 + 6^2 = 40$
$BC^2 = 4^2 + 4^2 = 32$

AC = AB so ISOSCELES.

(c) Find M, the mid point of AB. **M = (-3 , 1)**

(d) Find N, the mid point of AC. **N = (-1 , 3)**

(e) A MEDIATOR is the perpendicular bisector of a side.
Draw all three mediators of this triangle.
The Circumcentre, G, is the point of intersection of the mediators**.**

(f) Find the equations of the 3 Mediators ? ***y = - x*** ***y = 1/3 x + 2*** ***y = 3x + 6***

(g) Choose 2 of the mediator equations to solve simultaneously to find the coordinates of G

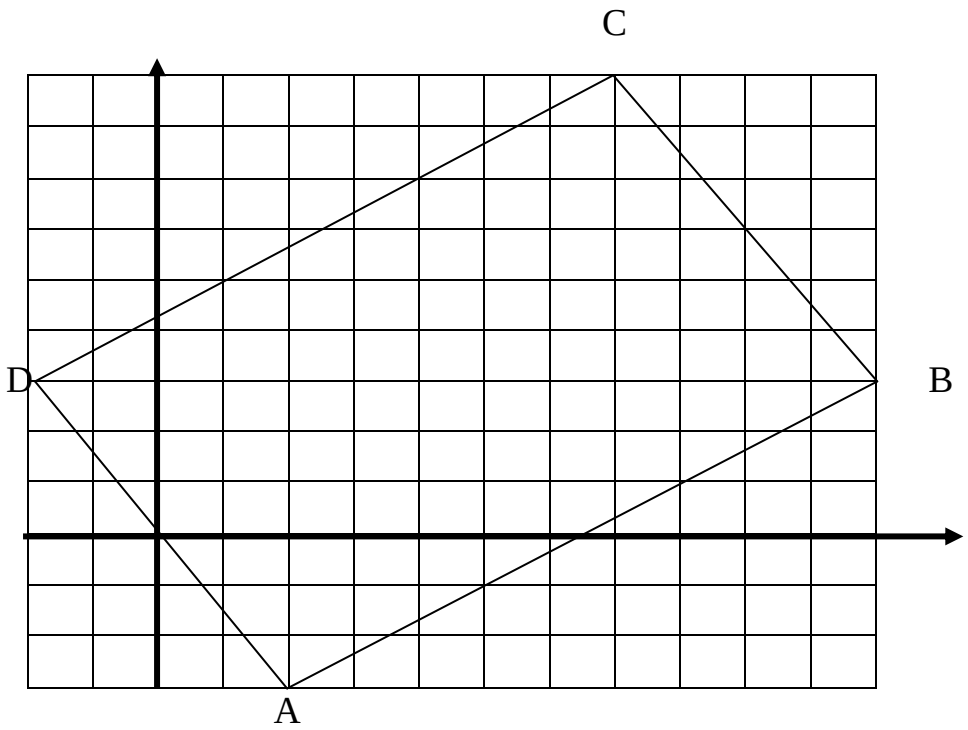
y=-x, y = 1/3 x + 2 so G = (-1.5 , 1.5)

(i) Calculate, by any method, the AREA of triangle ABC but be sure to explain what you are doing.

Could find length of BC = $\sqrt{32}$ and median is at right angles because it is an Isosceles triangle so area = $\frac{\sqrt{32} \times \sqrt{18}}{2}$ = 12 cm^2

3(a) **Prove** conclusively that the following four points form a **rectangle** and find its area **exactly.**

A(2 , -3) , B(11 , 3) , C(7 , 9) , D(-2 , 3)



Grad AB = $\frac{6}{9} = \frac{2}{3}$ Grad CD = $\frac{6}{9} = \frac{2}{3}$ so AB // CD

Grad AD = $-\frac{6}{4} = -\frac{3}{2}$ Grad BC = $-\frac{6}{4} = -\frac{3}{2}$ so AD // BC

Also $\frac{3}{2} \times \frac{-2}{3} = -1$ so ALL angles are 90^0

ABCD is a rectangle. AREA = AB ×BC = $\sqrt{(9^2 + 6^2)} \times \sqrt{(6^2 + 4^2)}$ = 78 cm^2

(sides are not all equal or it would have been a square)