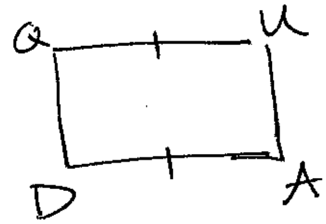
$$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2} \qquad m=\frac{y_2-y_1}{x_2-x_1}$$

COORDINATE PROOF EXAMPLES.

1. Prove that the quadrilateral with coordinates Q(-2,3); U(4,3); A(2,-2); D(-4,-2) is a parallelogram. TWO DIFFERENT WAYS.



Method 1:

opposite sides $\cong$ (distance)

Method 2:

opposite sides are $\parallel$ (slope)

$\overline{QU} \cong \overline{DA}$

$QU=\sqrt{(3-3)^2+(4+2)^2}=6$ ✓

$DA=\sqrt{(-2+2)^2+(-4-2)^2}=6$ ✓

$\overline{QD} \cong \overline{UA}$

$QD=\sqrt{(-2-3)^2+(-4+2)^2}=\sqrt{29}$ ✓

$UA=\sqrt{(-2-3)^2+(2-4)^2}=\sqrt{29}$ ✓

$\overline{QU} \parallel \overline{DA}$ and $\overline{QD} \parallel \overline{UA}$

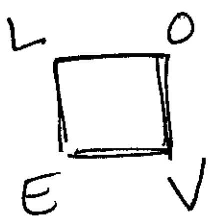
$m=\frac{3-3}{4+2}=\frac{0}{6}=0$ ✓

$m=\frac{-2+2}{-4-2}=\frac{0}{-6}=0$ ✓

$M=\frac{-2-3}{-4+2}=\frac{+5}{+2}$ ✓

$M=\frac{-2-3}{2-4}=\frac{5}{2}$ ✓

2. Find the area of the square with coordinates: L(2,-1); O(-1,-4); V(-4,-1); E(-1,2)



$A=s^2$ (Must find length of side)

$\overline{LO}=\sqrt{(-4+1)^2+(-1-2)^2}=\sqrt{18}$

$A=(\sqrt{18})^2=\boxed{18}$

* distance to prove $\cong$ sides
* slopes to prove $\parallel$ or $\perp$ sides/diagonals