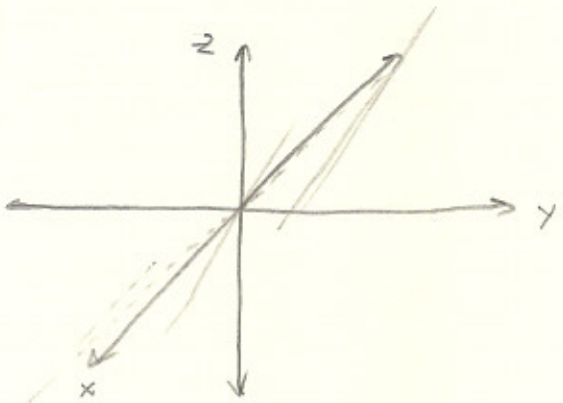
§ 13.6 CYLINDERS AND QUADRATIC SURFACES.

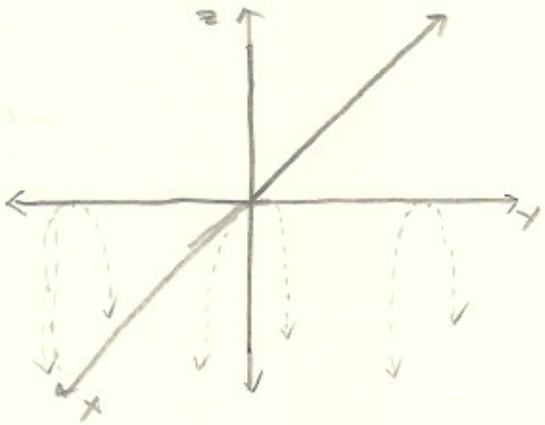
any surface with eq. of the following type

$$Ax^2 + By^2 + Cz^2 + Dxy + Exz + Fyz + \cdots$$

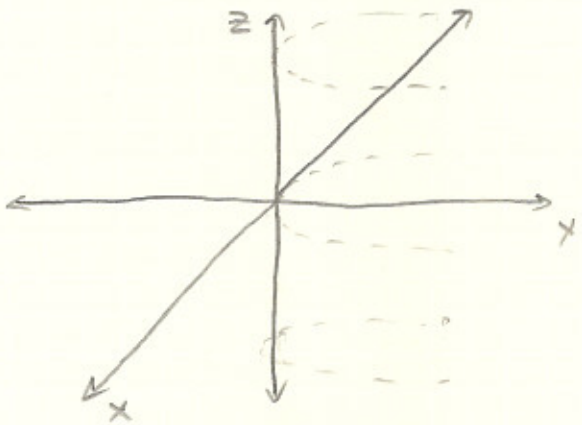
EX. DRAW $y = z + x^2$



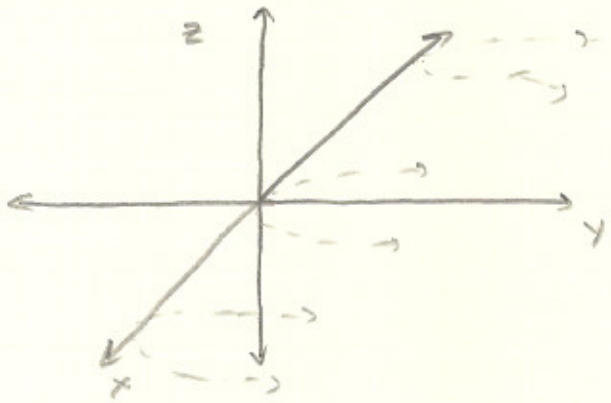
when $x = 0$ then $y = z$



when $y = 0$ then $z = -x^2$



when $z = 0$ then $y = x^2$

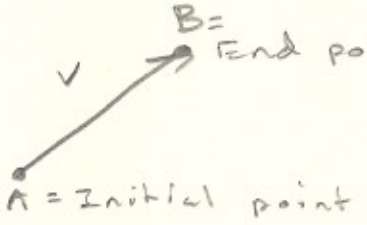


∴ we guess the surface to be.

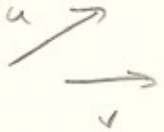
§ 13.2 VECTOR

a vector is a mathamatical object which has magnetute and direction.

note: two vectors with the same mag and direction will be considered identical.



OPERATIONS WITH VECTORS



u + v = another vector. with the initial point the same as

parallelogram law.

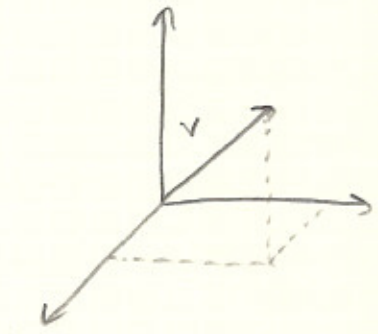
u + v = v + u

REPERSENTATION OF VECTORS.

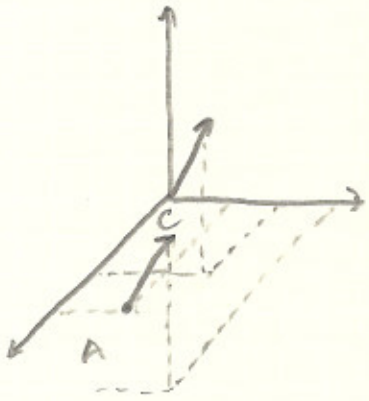
if the vector starts at zero. Then we can write the vector as $P(v_1, v_2, v_3)$ written as.

$$V = \langle v_1, v_2, v_3 \rangle$$

components of the vector.



Ex. Suppose that we have a vector $V = \langle v_1, v_2, v_3 \rangle$ and we want to start a point $A = (a_1, a_2, a_3)$?



point $C = (a_1 + v_1, a_2 + v_2, a_3 + v_3)$

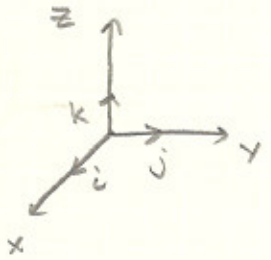
OTHER PROPERTIES

$u = \langle u_1, u_2, u_3 \rangle \quad v = \langle v_1, v_2, v_3 \rangle$

$u + v = \langle u_1 + v_1, u_2 + v_2, u_3 + v_3 \rangle$

STANDARD (BASIC) VECTORS

$\dot{\imath} = \langle 1, 0, 0 \rangle$
$\dot{\jmath} = \langle 0, 1, 0 \rangle$
$\dot{k} = \langle 0, 0, 1 \rangle$



we use these standard vectors to write the vector as.

$$v = \langle v_1, v_2, v_3 \rangle$$

$$v = v_1 \dot{\imath} + v_2 \dot{\jmath} + v_3 \dot{k}$$