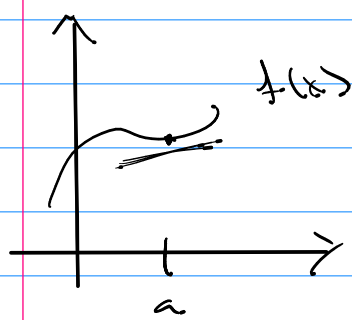
Math 344

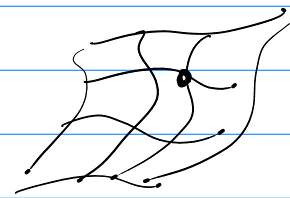
Blackboard → syllabus + calander

Back ups for lectures → chaos. math. wichita. edu



how does f(x) "change" @ x = a

derivative



12.1 Coord.

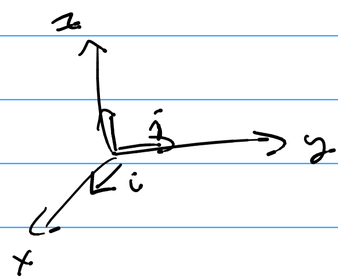
12.2 Vectors

12.3

12.4

$\vec{v}$ representations $\vec{v} = \langle a_1, a_2, a_3 \rangle$

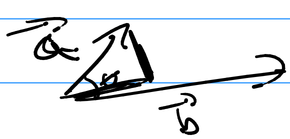
$\vec{v} = a_1 \vec{i} + a_2 \vec{j} + a_3 \vec{k}$



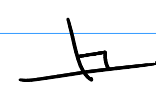
ops $\vec{v}_1 + \vec{v}_2$, $c\vec{v}$

products dot product $\vec{a} \cdot \vec{b}$ = scalar

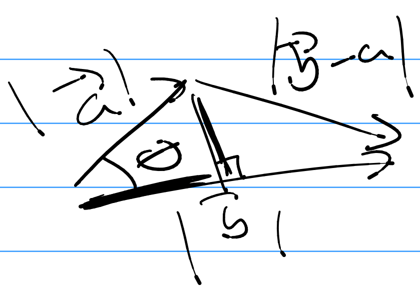
$\vec{a} \cdot \vec{b} = a_1 b_1 + a_2 b_2 + a_3 b_3 = |\vec{a}||\vec{b}| \cos\theta$



$\vec{a} \cdot \vec{b} = 0$ says $\perp$

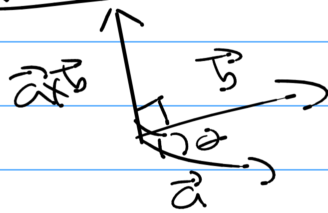


$\theta = 0$ $\vec{a} \cdot \vec{b} = |\vec{a}||\vec{b}|$



cross product

$$\vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_1 & b_2 \end{vmatrix}$$



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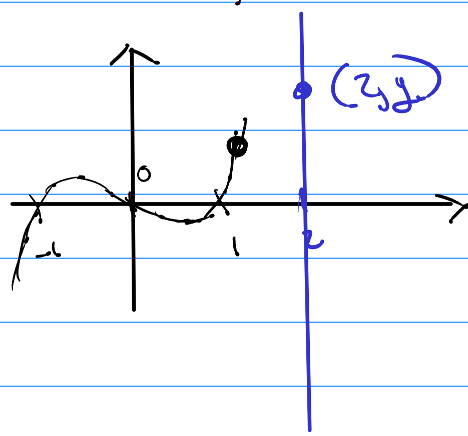
graphs ← solution to an equations

2D $\mathbb{R}^2$

$y = x^3 - x$

$x = 2$

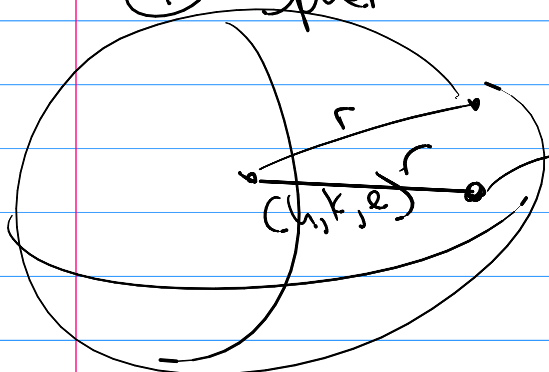


3D $\mathbb{R}^3$

Some graphs we should know.

① sphere

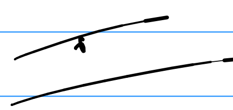
$$(x-h)^2 + (y-k)^2 + (z-l)^2 = r^2$$

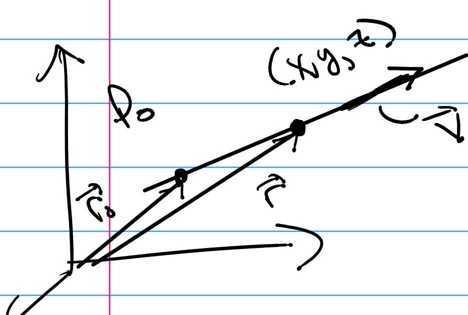


(x, y, z) on sphere

$r \geq 0$

② lines





$\vec{r} = \langle x, y, z \rangle$ $\quad \vec{r}_0 = \langle x_0, y_0, z_0 \rangle$

$\vec{v} = \langle a, b, c \rangle$

$$\vec{r} = \vec{r}_0 + t\vec{v}$$

$$\langle x, y, z\rangle = \langle x_0, y_0, z_0\rangle + \langle ta, tb, tc\rangle$$

$$\left[\begin{array}{l} x = x_0 + at \\ y = y_0 + bt \\ z = z_0 + ct \end{array}\right. \longrightarrow \frac{x - x_0}{a} = \frac{y-y_0}{b} = \frac{z-z_0}{c}$$

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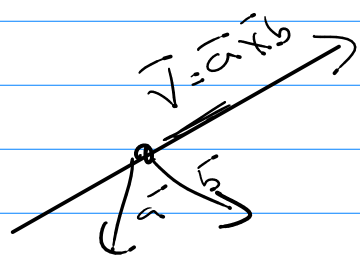
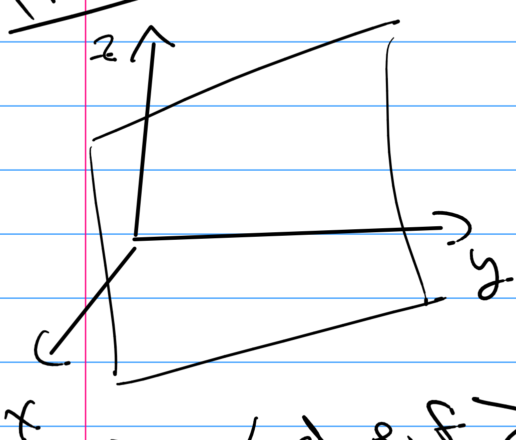
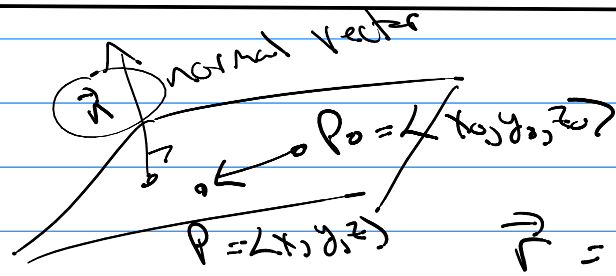
to do: ① eqn $\rightarrow$ make a graph

② given a graph (or info about it) $\rightarrow$ eqn



Plane





$\vec n = \langle d, e, f\rangle$

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$\vec r = \langle x, y, z\rangle$

$\vec r_0 = \langle x_0, y_0, z_0\rangle$

$$\vec n \cdot (\vec{PP_0}) = 0$$

$$\boxed{\vec n \cdot (\vec r - \vec r_0) = 0}$$

$$d(x - x_0) + e(y - y_0) + f(z - z_0) = 0$$

$$\boxed{dx + ey + fz + g = 0}$$ linear eqn of 3 variables