

Calc 3 - Assignment 4

Note Title

9/14/2011

~~① Find area of parallelogram with vertices $A(-2,1)$, $B(0,4)$, $C(4,2)$, and $D(2,-1)$. Hint: to take cross products of \mathbb{R}^2 vectors, consider them embedded in \mathbb{R}^3 with z -coordinates 0. Thus, a vector $\langle a, b \rangle \in \mathbb{R}^2$ is equivalent to $\langle a, b, 0 \rangle \in \mathbb{R}^3$~~

② Find the parametric equation of the lines

a) through $(6, -5, 2)$ parallel to $3i + 2j - k$

b) through $(1, 2, 3)$ and $(-4, 3, 0)$

c) through $(1, 9, 6)$ parallel to the line

$$l(t) = \langle 1+2t, 3+4t, 5+6t \rangle$$

d) through $(2, 1, 0)$, perpendicular to both $i+j$ and $j+k$

③ Find the parametric equation in \mathbb{R}^2 of a line

through $(-2, 4)$ and $(3, 9)$. Then find the traditional

slope-intercept equation of the same line. Then come

up with a hypothesis relating the parametric equation

$l(t) = P + t\vec{v}$ with the slope of $y = mx + b$. Find the

slopes of $l_1(t) = \langle 2, 3 \rangle + t \langle 2, 6 \rangle$ and $l_2(t) = \langle 1+3t, 4+12t \rangle$.

④ If $\ell(t) = \langle -1-2t, 3t, 1+4t \rangle$. Is $\langle -3, 3, 5 \rangle$ on that line? How about $\langle 1, -3, 1 \rangle$

⑤ If two lines in \mathbb{R}^2 are not parallel, do they have to intersect? How about two non-parallel lines in \mathbb{R}^3 ?

⑥ Can one line in \mathbb{R}^3 have two different parametric equations? Give examples.