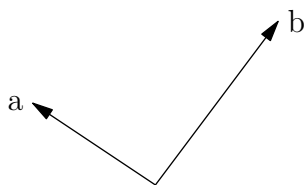


Your name: _____

Quiz no. 1 (2110 Multivariable Calculus,
Fall 2009)
September 14, 2009

20 min.

1. (3 points) Draw the vectors $a + b$ and $b - 2a$.



2. (4 points) Find the angle between the two vectors $\langle 3, 1, -1 \rangle$ and $\langle 1, 3, 1 \rangle$.

3. (3 points) Which of the following three expression makes sense?

- (a) $a \times (b \bullet c)$
- (b) $a \bullet (b \times c)$
- (c) $a \times (b \times c)$

4. (5 points) Find a non-zero vector orthogonal to the plane containing $P(0, 2, 3)$, $Q(-3, 4, 1)$ and $R(2, 3, 5)$. Compute the area of the triangle PQR .

5. (5 points) A cyclist is biking a distance of $4500m$ in the direction of NE. A strong wind blowing westwards is exerting a force of $120N$ on him. What is the work done by the cyclists against the wind?