

SULTAN QABOOS UNIVERSITY
DEPARTMENT OF MATHEMATICS AND STATISTICS

Math3207

Fall 2013

Quiz 1

Time: 30 minutes

Name:..... Section:..... ID Number:.....

Group 1: Knowledge Questions

Q1: What is the difference between a vector and a scalar? (2 points)

Group 2: Comprehension Questions

Q2: Identify the unit vectors among the following vectors: (2 points)

$$V_1 = [1, 1], \quad V_2 = [1, 0], \quad V_3 := [2, 1], \quad V_4 = \left[\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} \right].$$

Group 3: Application Questions

Q3: Find a vector perpendicular to the line $y = \frac{2}{3}x$. (2 points)

Q4: Find a vector along the line $y = \frac{2}{3}x$. (2 points)

Group 4: Analysis Questions

Q5: Given the points $A = (1, 2)$, $B = (3, 4)$, $C = (2, 3)$ and $D = (3, 3)$. (3 points)
Is it true that A, B, C and D are the vertices of a parallelogram? Justify your answer.

Group 5: Synthesis Questions

Q6: Give an example of a basis for \mathbf{R}^2 other than the standard basis $\{E_1, E_2\}$. Make sure you justify your answer. (4 points)

Group 6: Evaluation Questions

Q7: (5 points)
Use dot product to prove that the vector $V = [m, -1]$ is perpendicular to the line $y = mx + b$.