


<p>Basic Science Department Mathematics 2 Code: Math 102 Final Exam: 31 – 7 – 2012 Time Allowed: 2 hours</p>	 Modern University For Technology & Information	<p>Academic year: 2011 / 2012 Semester: Summer Examiners: Dr. Mona Samir Dr. Mohamed Eid</p>	
<p>Answer All questions</p>	<p>Faculty of Engineering</p>	<p>Marks</p>	
<p>Question 1</p>			
<p>(a) Solve the equation: $x^3 + 3x^2 - 4 = 0$, where it has two equal roots .</p>			3
<p>(b) Using mathematical induction to prove the validity of the following: $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \dots + \frac{1}{n.(n+1)} = \frac{n}{(n+1)}$</p>			3
<p>(c) Find the eigenvalues and the eigenvectors of the matrix $A = \begin{bmatrix} 1 & 2 \\ 1 & 2 \end{bmatrix}$.</p>			4
<p>Question 2</p>			
<p>(a) Using the binomial theorem, expand $(5 + 7x^5)^{-2}$.</p>			3
<p>(b) Use De Moivre's theorem to evaluate: $(-3 + \sqrt{6}i)^{\frac{3}{2}}$.</p>			3
<p>(c) Solve the linear system: $x + y + z = 5$, $2x - y + z = 2$, $2x + 2y - z = 4$.</p>			4
<p>Question 3</p>			
<p>(a) State the definition of sphere.</p>			2
<p>(b) Separate the lines $x^2 + xy - 2y^2 + 3x + 6y = 0$. Also, find the angle between them.</p>			4
<p>(c) Write the equation of plane that passes through (1, 2, 3), (0, 1, 4), (3, 0, 2).</p>			4
<p>Question 4</p>			
<p>(a) Describe the surface $y^2 + z^2 - 2x^2 = 0$</p>			1
<p>(b) Write the equation of circle with center (2, -1) and radius 3. Also, write its equation in parametric form.</p>			3
<p>(c) Find center, vertices and sketch the ellipse $x^2 + 4y^2 - 4x - 8y + 4 = 0$.</p>			3
<p>(d) Sketch the hyperbola $x^2 - 4y^2 + 4x + 8y + 4 = 0$.</p>			3

Good luck

Dr. Mona Samir

Dr. Mohamed Eid

Quiz I-Name: _____ **Group:** _____ **ID** _____ .

(1) Complete the statement: The ellipse is the locus of moving point such that....

(2) Sketch the ellipse $x^2 + 2y^2 + 4x - 8y + 4 = 0$.

Also, write its equation in parametric form.

(3) Sketch the curve $4x^2 - y^2 + 16x + 4y + 16 = 0$

(4) Determine the types of the surfaces: (a) $2x^2 + 2y^2 + 2z^2 - 3x = 0$

(b) $x^2 + y^2 - 2z^2 = 0$

Answer

Quiz II-Name: _____ Group: _____ ID _____.

(1) Complete the statement: The hyperbola is the locus of moving point such that....

(2) Sketch the ellipse $2x^2 + 3y^2 + 8x + 12y + 8 = 0$.

Also, write its equation in parametric form.

(3) Sketch the hyperbola $x^2 - 4y^2 + 4x - 16y - 16 = 0$

(4) Determine the types of the surfaces: (a) $x^2 + y^2 + z^2 - 4x - 2 = 0$

(b) $y^2 + z^2 - 1 = 0$

Answer

Mid-Term

(1) Complete the statement: The circle is the locus of moving point such that...

(2) Separate the lines of the equation $x^2 - 3xy + 2y^2 + 3x - 4y + 2 = 0$

Also, find the angle between them.

(3) Find the center and radius of the circle $x^2 + y^2 + 4x - 2y - 5 = 0$.

Also, write the tangent of this circle at the point (1, 2).

(4) Find vertex, focus and sketch the parabola $y^2 - 4y + 8x - 20 = 0$.
