


<p>Department of Basic Science Level: 1 Examiner: Dr. Mohamed Eid Time allowed: 3 hours</p>	 <p>Pyramids higher Institute P.H.I. For Engineering And Technology معهد الأهرامات العالي للهندسة و التكنولوجيا</p>	<p>Prep. Year: Final Exam Course: Mathematics 2 Course Code: BAS 013 B Date: September, 2015</p>	
<p>The Exam consists of one page      Answer all questions      No. of questions: 5      Total Mark: 70</p>			
<p><b>Question 1</b> Find <math>y'</math> :</p> <p>(i) <math>y = 2x^4 + 3 \cos x</math>      (ii) <math>y = x^{-3} + \sin 2x</math>      (iii) <math>y = (x + \tan x)^4</math>  (iv) <math>y = \sec 3x + \sin^3 x</math>      (v) <math>y = 3^x \cdot \ln x</math>      (vi) <math>y = \tanh^{-1} x + \tan^{-1} x</math>  (vii) <math>y = 4^{x^3} + \sin \ln x</math>      (viii) <math>y = \log x \cdot \cosh x</math>      (ix) <math>y^3 = x \sinh(xy)</math></p>			18
<p><b>Question 2</b> Find the following integrals:</p> <p>(a) <math>\int (2x^4 + 3^x + 3) dx</math>      (b) <math>\int \left( \frac{2x}{1+x^2} + \frac{2x}{\sqrt{1+x^2}} \right) dx</math>      (c) <math>\int x \cdot e^x dx</math>  (d) <math>\int 3x^2 \cdot (2 + x^3)^8 dx</math>      (e) <math>\int (x + \sqrt{x})^2 dx</math>      (f) <math>\int \frac{x}{x^2 - 5x + 6} dx</math></p>			18
<p><b>Question 3</b> Find the following integrals:</p> <p>(a) <math>\int \sin 3x \cdot \cos 2x dx</math>      (b) <math>\int \cos 3x \cdot \cos 2x dx</math>  (c) <math>\int \cos^2 4x dx</math>      (d) <math>\int (\cos 2x + \sin 2x)^2 dx</math></p>			12
<p><b>Question 4</b></p> <p>(a) Find the area of the region between the curve <math>y = x^2 - x</math>, x-axis, x in [0, 2].      4  (b) If the region between the curve <math>y = x^2 + 1</math>, x-axis, x in [1, 2] is rotated about  (i) x-axis      (ii) y-axis. Find the volume of the generated solids <math>V_x</math>, <math>V_y</math>.      6</p>			
<p><b>Question 5</b></p> <p>(a) Write the symmetric and parametric form of the line that passes through the points  (0, 1, 3), (3, 2, -2).      4  (b) Find the angle between the plane <math>2x - y + z + 7 = 0</math> and the line <math>\frac{x}{1} = \frac{y}{-2} = \frac{z+1}{2}</math>.  Also, find the point of intersection.      4  (c) Write the equation of the plane that passes through the points:  (2, 1, 2), (1, 1, 4), (3, 0, 1).      4</p>			