


<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: January , 2017</p>	
<p>The Exam consists of one page      Answer all questions      No. of questions: 5      Total Mark: 70</p>			
<p><b>Question 1</b></p>			
<p>Find <math>y'</math> from the following:</p>			18
(a) $y = 3^x + \tanh 3x$	(b) $y = x^4 \cdot \cosh x^2$	(c) $y = \ln x + \sinh 2x$	
(d) $y = \tan^{-1} x + \sin^{-1} x$	(e) $y = t + \ln t, x = t \cdot e^t$	(f) $y^4 = x^3 + e^{xy}$	
<p><b>Question 2</b></p>			
<p>Find the following integrals:</p>			
(i) $\int (x^3 + 3^x + \frac{1}{x^3}) dx$	(ii) $\int (\frac{x}{1+x^2} + \frac{2}{1+x}) dx$	(iii) $\int (2^x + 3^x)^2 dx$	18
(iv) $\int (\frac{1}{3} + \sin 2x) dx$	(v) $\int x \cdot e^x dx$	(vi) $\int \ln x dx$	
(vii) $\int (x + \cosh x) dx$	(viii) $\int (\cos 2x + \cos^2 x) dx$	(ix) $\int \frac{x-1}{x^2-4x} dx$	
<p><b>Question 3</b></p>			
<p>(a) Find the area of the region between the curve <math>y = x^2 - 2x</math>, x-axis, x in [1, 3].</p>			4
<p>(b) If the region between the curve <math>y = \sqrt{1+x^2}</math>, x-axis, x in [1, 2] is rotated about</p>			
<p>(i) x-axis      (ii) y-axis. Find the volume of the generated solids <math>V_x, V_y</math>.</p>			8
<p><b>Question 4</b></p>			
<p>(a) State the definition of the plane.</p>			2
<p>(b) Find the angle between the planes : <math>x - 2y + 2z + 7 = 0, 3x + 4z - 3 = 0</math>.</p>			4
<p>(c) Write the equation of the plane that passes through the points:</p>			
<p>(1, 1, 2), (-1, 2, 4), (3, 0, 1).</p>			6
<p><b>Question 5</b></p>			
<p>(a) State the definition of the sphere.</p>			2
<p>(b) Write the equation of the plane that passes through the point (3, -1, 0) and its</p>			
<p>normal vector <math>\vec{N} = 2i - j + 3k</math>.</p>			4
<p>(c) Write the equation of the sphere with center (2, -2, 3) and radius is 4.</p>			4

*Good Luck*

*Dr. Mohamed Eid*