



Engineering Mathematics Department Math. 1 Code: Math 101 Mid-Term Exam 7 / 4 / 2013 Time Allowed: 1 hour	 Modern University For Technology & Information Faculty of Engineering	Academic year: 2012 / 2013 Semester: Spring Examiners: Dr. Mona Samir Dr. Mohamed Eid
Answer All Questions	Total Mark: 30	
<p>[1] Find the following limits:</p> <p>(a) $\lim_{x \rightarrow 0} \frac{\sin^4 x}{3^x - 1}$ (b) $\lim_{x \rightarrow 0} \frac{x - \sin x}{x + \sin x}$ (c) $\lim_{x \rightarrow \infty} \frac{2x + 1}{x^2 + x}$</p> <p>[2](a) Find the maximum and minimum points of : $f(x) = x^2 - 4x + 5$</p> <p>(b) Find y' from the equation: $y^3 + \sin y + x^2 + \sin^{-1} x = 6$</p> <p>[3] Find y' where:</p> <p>(a) $y = 3x^4 + 3^x + 2$ (b) $y = 5^{x^2} + x^{-3} \cdot \cos x^3$</p> <p>(c) $y = \sin \ln x + \log(x + \tan x)$ (d) $y = \sinh^4 x \cdot \sin^{-1} x^2$</p> <p>(e) $y = [\tan^{-1} x^3 - \tanh^{-1} x]^8$ (f) $y = \sec x \cdot \operatorname{sech} 2x$</p> <p>(g) $y = t^3 - \tan t, \quad x = t^2 + \cosh t$ (h) $y = \sqrt{x + 3} \cdot \sinh^{-1} x$</p>		<p>6</p> <p>4</p> <p>4</p> <p>16</p>

Good luck

Dr. Mona Samir

Dr. Mohamed Eid

Basic Science Department Math. 1 Code: Math 101 Final Exam: 26 / 5 / 2013 Time Allowed: 2 hours	 Modern University <small>For Technology & Information</small>	Academic year: 2012 / 2013 Semester: Spring Examiners: Dr. Mona Samir Dr. Mohamed Eid
Answer All Questions	Faculty of Engineering	Total Mark: 40
Question 1		
<p>Find y' from the following:</p> <p>(a) $y = 2x^3 + 3 \sin 2x$ (b) $y = \sin 2x \cdot \log(x^2 + 3)$</p> <p>(c) $y = [5^{x^3} + \cosh x]^8$ (d) $y = \sin \ln x + \ln \cos x$</p>	8	
Question 2		
<p>(a) Find y' where $y = t + \sinh^4 t$, $x = t + \sin^{-1} t$</p> <p>(b) Find y' from the equation: $x^2 y^3 + \sin(xy) = 2x$</p> <p>(c) Determine the maximum and minimum points of the function: $f(x) = x^3 + 6x^2 + 12x$</p>	2 3 3	
Question 3		
<p>Find the following integrals:</p> <p>(a) $\int (x^4 + \frac{4}{x} + 4x) dx$ (b) $\int (4^x + 3 \cos 2x) dx$ (c) $\int \frac{1 + \cos x}{x + \sin x} dx$</p> <p>(d) $\int \frac{x}{x^2 - 3x - 4} dx$ (e) $\int x \cdot \ln x dx$ (f) $\int \frac{x^3}{\sqrt{1-x^2}} dx$</p>	12	
Question 4		
<p>(a) Find the integral: $\int \cos^4 x dx$</p> <p>(b) Compute the area of the region bounded by the curve $f(x) = (x - 2)^2$, x- axis, x in $[0, 2]$.</p> <p>(c) If the above region is rotated about: (i) x- axis (ii) y - axis. Compute the volume V_x and the volume V_y of the generated solids.</p>	12	

Good luck

Dr. Mona Samir

Dr. Mohamed Eid

Group	ID	Name
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Find the integrals:

(1) $\int (x^2 + 2^x) dx$

(2) $\int 2x[3+x^2]^8 dx$

(3) $\int (x^2+3)^2 dx$

(4) $\int \left(\frac{1}{x} + \frac{3}{x-2} + \frac{1}{x^2} \right) dx$

(5) $\int \frac{x}{x^2-2x-3} dx$

(6) $\int x \sin x dx$

Quiz IV	ID:	Name:
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Find the integrals:

(1) $\int \left(\frac{1}{x} + \frac{1}{x^3} \right) dx$

(2) $\int (3^x + 2 \cos 3x) dx$

(3) $\int (x \ln x) dx$

(4) Compute the area of the region bounded by the curve $y = \frac{1}{x+2}$, x-axis, x in $[0, 2]$.

(5) If the region bounded by the curve $y = \frac{1}{x+2}$, x-axis, x in $[0, 2]$ is rotated about x-axis. Find the volume of the generated solid.

(6) Find the length of the curve $y = 1 + x\sqrt{x}$ between the points $(0, 1)$, $(1, 2)$.