UGANDA MARTYRS UNIVERSITY NKOZI

FACULTY OF SCIENCE

DEPARTMENT OF MATHEMATICS AND STATISTICS

SUPPLEMENTARY/SPECIAL EXAMINATIONS

UNIVERSITY EXAMINATIONS AUGUST 2014

YEAR ONE- ECON, GEN &FM

CALCULUS 1I

DATE: 7TH AUGUST 2014

TIME: 2:00 - 5:00 PM

DURATION: 3HRS

Instructions:

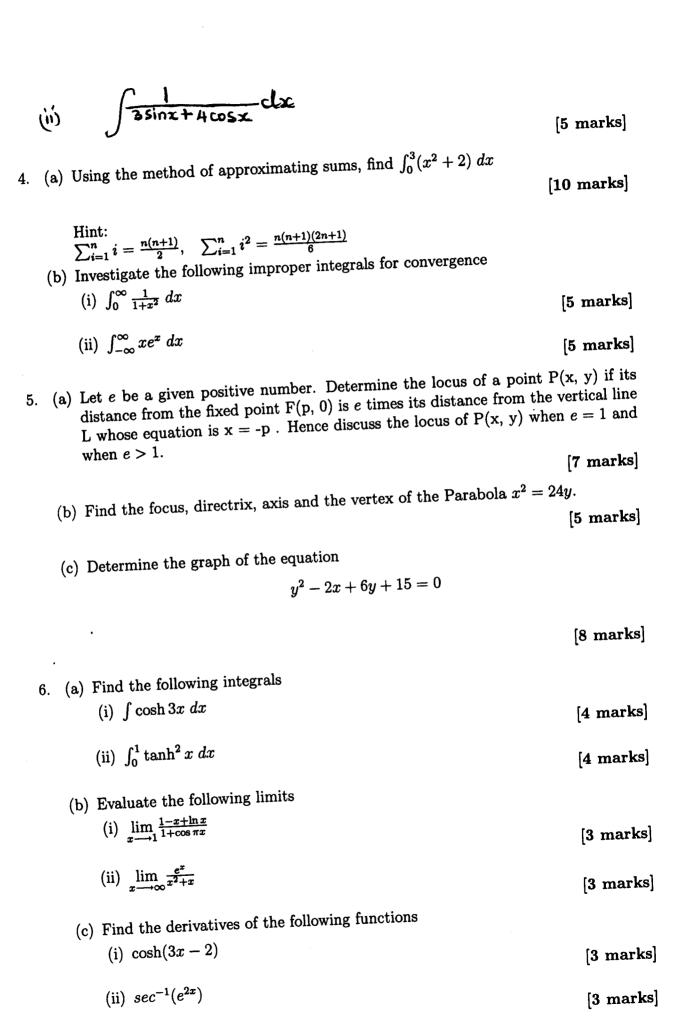
i) Attempt FIVE Questions

ii) Write on both sides of the paper but begin a new question on afresh page

		(i) $\int x\sqrt{x^2+1} \ dx$	[4 marks]	
		(ii) $\int \frac{\sin x}{\sqrt{x}} dx$	[4 marks]	
		(iii) $\int \frac{7}{x^2-6x+25} dx$	[4 marks]	
		$(111) J x^2 - 6x + 25 \text{ and}$	[4 marks]	
	(b)	Let $u = u(x)$ and $v = v(x)$ be differentiable real valued functions. Chain rule of differentiation, show that	By using the	
Ÿ.		$\int u dv = uv - \int v du$		
		Hence or otherwise, find $\int e^x \sin x \ dx$.		
			[8 marks]	
2.	coordinates of each.			ctangular
		(i) $A(2, \frac{\pi}{2})$	[3 marks]	
		(ii) $B(-2,\frac{2\pi}{3})$		
	(b)	Convert the following polar equations to rectangular forms and ske resulting graphs	[3 marks] tch the	
		(i) $\frac{6}{r} = \sin \theta$		
		(**) 2 -in 00 9	[4 marks]	
		(ii) $r^2 \sin 2\theta = 8$	[4 marks]	
	(c)	Express the following rectangular equations in polar form		
		(i) $y = x^2$	[3 marks]	
		(ii) $(x^2 + y^2)^5 = 4(xy)^2$	[0 111011111]	
			[3 marks]	
3.	(a)	By the method of partial fractions, find;		
		(i) $\int \frac{5x+3}{x^3-2x^2-3x} dx$	[5 marks]	
		(ii) $\int \frac{6x^2 - 15x + 22}{(x+3)(x^2+2)^2} dx$		
	4- •		[5 marks]	
	(b)	Using the substitution $t = \tan \frac{x}{2}$, find;		
		(i) $\int \frac{1}{\cos x - \sin x - 1} dx$		

[5 marks]

1. (a) Find the following integrals



END