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Premier University	
Department of Computer Science & Engineering	
3rd Semester Special Retake Final Exam, Spring 2020 (Total 35 Marks)	
Course Code: MAT 201	Course Title: Engineering Mathematics-III

Instructions: Answer five questions. Each question carries equal marks.

1 Find $z^{1/n}$; for n=3, z = 1-i in ***C*** (, the Argand Plane). 7

2 Let f(z) = 2/z, (z is in ***C*)** and c is the unit circle about the origin oriented counterclockwise. Can we apply Cauchy Integral Theorem to evaluate $\oint_c f(z)dz$? Evaluate $\oint_c f(z)dz$, if possible. 7

3 Find the direction cosines and direction angles of the vector $\vec{F} = 2\hat{i} + \hat{j} - 3\hat{k}$. 7

4 Let S be the sphere of radius r about the origin, given in spherical coordinates by: x = $r\sin\phi\cos\theta$, y = $r\sin\phi\sin\theta$, and z = $r\cos\phi$, $0 \le \theta \le 2\pi$, and $0 \le \phi \le \pi$. Let $\vec{F} = 3yz\hat{j}$, and $\vec{F}$ and $\operatorname{div}\vec{F}$ are continuous over S, and the region V is enclosed by S. Compute both sides of Gauss's formula (as given in the class) and show that they are equal. 7

5 Suppose that X has a normal probability distribution with mean 10 and standard deviation 3. Determine the value of P(3<x<12), for x in X (; you do not need to give values from the table). 7