

$$\int_0^1 (-20t i + 10t^2 j - 8t^5 k) dt = \left[\frac{(-20t^2)}{2} i + \frac{(10t^3)}{3} j - \frac{(8t^6)}{6} k \right]$$

$$= \frac{-20(1)^2}{2} i + \frac{10(1)^3}{3} j - \frac{8(1)^6}{6} k$$

$$\int_0^1 (-20t) i + (10t^2) j + (8t^5) k dt = -10i + \frac{10}{3} j - \frac{4}{3} k$$

M.U.E.S.A
ENGINEERING

MAT 102

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1) $r = xi + yj + zk$

$r = ti + t^2j + t^3k$

$\frac{dr}{dt} = i + 2tj + 3t^2k$

$\left| \frac{dr}{dt} \right| = \sqrt{(1)^2 + (2t)^2 + (3t^2)^2}$
 $\left| \frac{dr}{dt} \right| = \sqrt{1 + 4t^2 + 9t^4} \quad t = 1$

$\left| \frac{dr}{dt} \right| = \sqrt{1 + 4 + 9}$

$\left| \frac{dr}{dt} \right| = \sqrt{14}$

$\vec{v} = \frac{1}{\sqrt{14}} (ti + t^2j + t^3k) \quad \text{at } t = 1$

$\left| \vec{v} \right| = \frac{1}{\sqrt{14}}$

$\frac{1}{\sqrt{14}} + \frac{1}{\sqrt{14}}, \frac{1}{\sqrt{14}}$

2) $A = 4t^3j + 5k \quad B = 2t^2i + 4tj$

$G = A \times B$

$G =$	i	j	k
	0	$4t^3$	5
	$2t^2$	$4t$	0

$G = i$	$4t^3$	5	-1	0	5	k	0	$4t^3$
	$4t$	0		$2t^2$	0		$2t^2$	$4t$

$G = -20ti + 10t^2j - 8t^5k$