

GROUP NAME:	Student Names (First and Last)
Logo:	Speaker/Presenter: _____
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Topics:	QC/Leader: _____

Instructions: **TEST #3**
Problem #7

$x = u + 2v$
 $y = 3u - 2v$

$y = 3x = 0$
 $y - 3x = -8$

$y = -x + 4$
 $y + 2x = 4$
 $y + 2x = 0$

$y - 3x$
 $3u - 2v - 3(u + 2v)$
 $3u - 2v - 3u - 6v$
 $= -8v$

$y - 3x = -8v = 0 \Rightarrow v = 0$
 $y - 3x = -8v = -8 \Rightarrow v = 1$

$y + 2x$
 $3u - 2v + 2(u + 2v)$
 $3u - 2v + 2u + 4v$

$y + 2x = 4u = 4 \Rightarrow u = 1$
 $y + 2x = 4u = 0 \Rightarrow u = 0$

$\frac{\partial x}{\partial u} = 1 \quad \frac{\partial y}{\partial u} = 3$
 $\frac{\partial x}{\partial v} = 2 \quad \frac{\partial y}{\partial v} = -2$

$\Rightarrow J = \begin{vmatrix} 1 & 3 \\ 2 & -2 \end{vmatrix} = 8$

$\int_0^1 \int_0^1 [3(u+2v) - 2(3u-2v)] \cdot 8 \, du \, dv$

$= 8 \int_0^1 \int_0^1 -3u + 10v \, du \, dv$

$8 \int_0^1 \left. -\frac{3u^2}{2} + 10vu \right|_0^1 \, dv$

$\rightarrow 8 \int_0^1 -\frac{3}{2} + 10v \, dv$

$= 8 \left(-\frac{3}{2}v + \frac{10v^2}{2} \Big|_0^1 \right)$

$= 8 \left(\left(-\frac{3}{2}\right) + 5 \right) = 28$