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| Name: | |
| J#: | |
| Date: **2017 July 25** | |

Exercise Type:

**Quiz**

| Standard: This student is able to... | Mark: |
|---|---|
| **C07: DoubleInt.** Compute and apply double integrals. | |
| ⋆ reattempt due on: | |

Find a double iterated integral that equals the area of the region bounded by $y = 2x$ and $y = x^2$. (Do not solve this integral.)

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Exercise Type:

**Quiz**

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| **C09: PolCylSph.** Apply polar, cylindrical, and spherical transformations of variables. | |
| ⋆ reattempt due on: | |

Express the volume of the sphere $x^2 + y^2 + z^2 = 49$ as a triple iterated integral of either cylindrical or spherical coordinates. (Do not solve this integral.)

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Exercise Type:

**Quiz**

| Standard: This student is able to... | Mark: |
|---|---|
| **C11: LineInt.** Compute and apply line integrals. | |
| ⋆ reattempt due on: | |

Rewrite $\int_C yz\,ds$ as a definite integral with respect to $t$, where $C$ is the line segment beginning at $\langle 3, 2, 1\rangle$ and ending at $\langle 0, 2, 5\rangle$. (Do not solve this integral.)

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| **S10: SurfInt.** Compute and apply surface integrals. | |
| ⋆ reattempt due on: | |

The function $\mathbf{r}(u,v) = \langle 1-u+3v, 2-2u+v, 3+u-v\rangle$ where $0 \leq u \leq 1$ and $0 \leq v \leq 1$ parametrizes the parallelogram $S$ with vertices $\langle 1,2,3\rangle, \langle -1,0,4\rangle, \langle 2,1,3\rangle, \langle 4,3,2\rangle$, oriented in the direction of $\left\langle \frac{1}{\sqrt{18}}, \frac{1}{\sqrt{18}}, \frac{4}{\sqrt{18}} \right\rangle$. Compute the flux $\iint_S \mathbf{F}\cdot\mathbf{n}\,d\sigma$ where $\mathbf{F} = \langle x+z, 4, y\rangle$.

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| **S11: GreenStokes.** Apply Green's Theorem and Stokes's Theorem. | |
| ⋆ reattempt due on: | |

Green's Theorem states that if the boundary $\partial R$ of a 2D region $R$ is oriented counter-clockwise, then circulation may be computed as $\int_{\partial R} \mathbf{F} \cdot d\mathbf{r} = \iint_R \operatorname{curl} \mathbf{F} \cdot \mathbf{k}\, dA$.
Let $C$ be the boundary of the unit square where $0 \leq x \leq 1$ and $0 \leq y \leq 1$ oriented counter-clockwise. Express the circulation of the vector field $\langle 3y^2, 4x + 3y \rangle$ around $C$ as a double iterated integral. (Do not solve this integral.)

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**Quiz**

| Standard: This student is able to... | Mark: |
|---|---|
| **S12: DivThm.** Apply the Divergence Theorem. | |
| ⋆ reattempt due on: | |

The Divergence Theorem states that if $\partial D$ is the outward-oriented boundary of a 3D solid $D$, then flux may be computed as $\iint_{\partial D} \mathbf{F} \cdot \mathbf{n}\, d\sigma = \iiint_D \operatorname{div} \mathbf{F}\, dV$.
Let $D$ be the cube where $1 \leq x \leq 4$, $1 \leq y \leq 4$, and $1 \leq z \leq 4$. Express the flux $\iint_{\partial D} \langle xz, 4xy^2, 3xyz \rangle \cdot \mathbf{n}\, d\sigma$ as a triple iterated integral. (Do not solve this integral.)