



Quiz # 9
Math 102-011 Calculus
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YOUR NAME:

In this quiz you can use fingers, calculators or smart phones to do your calculations.

However show your work in detail. Correct answer without proper explanation does not receive any partial credits.

Q-1) Let D be the region in the plane bounded by the lines $y = 3x$, $y = 8x$ and $x = 7$.
And let $f(x) = \sin(x^2)$.

- (i) Write the double integral $\iint_D f$ as an iterated integral in the order $dx dy$.
- (ii) Write the double integral $\iint_D f$ as an iterated integral in the order $dy dx$.
- (iii) Evaluate the double integral $\iint_D f$.

: Grading is 20+20+60 points.

Answer:

(i)
$$\iint_D f = \int_0^{21} \int_{y/8}^{y/3} \sin(x^2) dx dy + \int_{21}^{56} \int_{y/8}^7 \sin(x^2) dx dy.$$

(ii)
$$\iint_D f = \int_0^7 \int_{3x}^{8x} \sin(x^2) dy dx.$$

(iii)

$$\begin{aligned} \iint_D f &= \int_0^7 \int_{3x}^{8x} \sin(x^2) dy dx \\ &= \int_0^7 5x \sin(x^2) dx \\ &= \frac{5}{2} \int_0^7 (2x) \sin(x^2) dx \\ &= \frac{5}{2} \left(-\cos(x^2) \Big|_0^7 \right) \\ &= \frac{5}{2} (1 - \cos(49)) \approx 1.75. \end{aligned}$$