HW4

In Progress

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Consider the function $F(x)$ with the properties that $F'(x) = e^{-x^2/5}$ and $F(0) = 3$. Use an online calculator to find a numerical approximation to $F(6)$.

$$F(6) \approx \boxed{4.98137}$$

Select a blank to input an answer

Q1

SAVE

All changes saved

Write an expression for the function, $f(x)$, with the properties $f'(x) = \dfrac{\cos(x)}{x}$ and $f(1) = 5$.

$$f(x) = \boxed{5} + \int_{1}^{\boxed{x}} \boxed{\frac{\cos(t)}{t}}\, dt$$

Select a blank to input an answer

Q2

SAVE

All changes saved

$$\int (x^6+9)^2\,dx = \boxed{\frac{x^{13}}{13}+\frac{18x^7}{7}+81x+C}$$

Note that you can check your answer by differentiation.

Select a blank to input an answer

Q3

SAVE

All changes saved

Find the general antiderivative $F(x)$ of the function $f(x) = -9x^4 \cos(x^5)$.

$$F(x) = \boxed{-\frac{9}{5}\sin\left(x^5\right) + C}$$

Note that you can check your answer by differentiation.

Select a blank to input an answer

Q4

SAVE

All changes saved

$$\int \sin^9(2x)\cos(2x)\,dx = \boxed{\frac{1}{20}(\sin(2x))^{10} + C}$$

Note that you can check your answer by differentiation.

Select a blank to input an answer

Q5

SAVE

All changes saved

Input an expression below **(DO NOT ROUND)** CLOSE

$$\frac{q^2}{4}\sin(4q)+\frac{q}{8}\cos(4q)-\frac{1}{32}\sin(4q)+C$$

A− A+

Q6

SAVE

All changes saved

Select an option ✕ CLOSE

neither integration by substitution or by parts is appropriate

integration by parts is more appropriate

integration by substitution is more appropriate

2. $\int \frac{x^4}{1+x^5}\,dx$ integration by substitution is more appropriate

3. $\int x^4 e^{x^5}\,dx$ integration by substitution is more appropriate

4. $\int x^4 \cos(x^5)\,dx$ integration by substitution is more appropriate

5. $\int \frac{1}{\sqrt{5x+1}}\,dx$ integration by substitution is more appropriate

Q7

SAVE

All changes saved

Input an expression below **(DO NOT ROUND)**

CLOSE

$$\frac{\left(x^2 \sin\left(x^2\right) + \cos\left(x^2\right)\right)}{2} + C$$

A− A+

Q8

SAVE

All changes saved

Input an expression below (YOU MAY ROUND TO 2 DECIMAL PLACES) CLOSE

86.05

where $g(x)$ has the values given in the following table:

x	0	0.5	1	1.5	2	2.5	3
$g(x)$	2	2.1	3.6	4.2	5.7	6.4	7.43

To solve this exercise:

1. Use integration by parts to simplify the integral.

2. Estimate the remaining integral using a left Riemann sum.

Q9

SAVE

All changes saved

Input an expression below **(DO NOT ROUND)** CLOSE

$-e^{-x^2}$

A− A+

2. $\frac{d}{dx}\int_{x^1}^{-4} e^{-t^2}\,dt = -e^{-x^2}$

Q10

SAVE

All changes saved