

Math 131 - Quiz 8

May 7, 2020

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz. This quiz is due no later than May 12.

1. (4 points) Each of these has a very specific mistake. Identify the mistake.

(a) $\int_1^2 (x^2 + x) dx = \left(\frac{1}{3}x^3 + \textcircled{1} \right) \Big|_1^2$
Should be $\frac{1}{2}x^2$

(b) $\left(\frac{d}{dt} \right) \left(\int_0^x \sin t^2 dt \right) = \sin x^2$
This should be a derivative with respect to x , $\frac{d}{dx}$.

(c) $\int_1^{\pi/2} \cos x dx = \sin(1) - \sin(\pi/2)$
Backward! Should be $\sin(\pi/2) - \sin(1)$

(d) $\frac{d}{dx} \left(\int_x^5 \sqrt{t^2 + 1} dt \right) = \sqrt{1 + x^2}$
Reverse the integration bounds.

2. (2 points) Use the following table of values to evaluate the definite integral $\int_{0.75}^{1.50} 2g'(x) dx$.

x	0.50	0.75	1.00	1.25	1.50
$g(x)$	6.08	6.90	8.00	9.41	11.14
$g'(x)$	2.74	3.82	5.00	6.26	7.60

$$\begin{aligned} \int_{0.75}^{1.50} 2g'(x) dx &= 2g(x) \Big|_{0.75}^{1.50} = 2g(1.50) - 2g(0.75) \\ &= 2(11.14) - 2(6.90) \\ &= \boxed{8.48} \end{aligned}$$

3. (2 points) In order to evaluate the following integral, an appropriate u -substitution should be made. Carry out the substitution and write the new integral. Do not evaluate the new integral.

$$\int \frac{8x+4}{(x^2+x)^4} dx$$

$$u = x^2 + x$$

$$du = (2x+1) dx$$

$$4 du = (8x+4) dx$$

$$\int \frac{4}{u^4} du$$

4. (2 points) Let $F(x) = \int_0^x (2t + \cos t) dt$. Evaluate $F(\pi)$.

$$F(\pi) = \int_0^{\pi} (2t + \cos t) dt = t^2 + \sin t \Big|_0^{\pi}$$

$$= (\pi^2 + \sin \pi) - (0^2 + \sin 0)$$

$$= \pi^2$$