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**I. Determine if the following propositions are True (T) or False(F) (5 points each):**

- T 1. ~~(T)~~ Having  $\int (\sin x + \cos x) dx$  is the same as having  $\int (\sin x) dx + \int (\cos x) dx$
- T F 2. ~~(F)~~ The answer for  $\int 6 \frac{\csc(3x)}{\sin(3x)} dx$  is  $-2 \cot(3x) + C$
- T 3. ~~(T)~~  $\int x(x^2 + 3)^2 dx = \frac{1}{6}(x^2 + 3)^3 + C$
- # ~~(T)~~ 4. ~~(T)~~  $\int (x^2 - 3) \tan(x^2 - 3x) dx = -\ln |\cos(x^2 - 3x)| + C$
- F 5. ~~(F)~~ The integral of  $\int (2 \sin 3x + 3x) dx$  is  $-6 \sin 3x + 3 + C$

**II. Solve the following exercises, show ALL your procedure and frame your final answer. (15 points each).**

If the equation of acceleration of an object is  $a(t) = \frac{3}{t-4}$  and the velocity at  $t=5$  is 8 m/s, then find the equation that determines the velocity of the object at any time  $t$ .

$$v(t) = 3 \ln |t-4| + c$$

$$8 = 3 \ln |1| + c$$

$$c = 8$$

$$v(t) = 3 \ln |t-4| + 8$$

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**III. Find the antiderivative or integral of the following problems. SHOW YOUR ENTIRE PROCEDURE. (15 pts each)**

1-  $h(x) = 96 \sin^2(2x+\pi) \cos(2x+\pi)$

$$du = 2 \cos(2x+\pi)$$

$$48 \int \frac{(\sin(2x+\pi))^3}{3} + \sin(2x+\pi)$$

$$H(x) = 16 \sin^3(2x+\pi) + C$$

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