

Show work for partial credit. I have more scrap if you need it. I'm rooting for you!

When you are finished, turn in your reference sheet and scrap paper along with your test, but your responses must be on here.

1. Match the technique we could successfully use to compute the antiderivative, as per instructions:

Technique	What I want you to show (don't integrate the final integral!)
$w$ -Sub	$w, dw$ , and the integral with respect to $w$
Parts	$u, u', v, v'$ , and $uv - \int u'v dx$
Partial Fractions	the expansion, and the system of linear equations to solve for $A, B$
Trig Sub	triangle pic, $x&dx$ , integral with respect to $\theta$ reduced
Improper	limit integral set up

(a)  $\int e^{5t} dt$

room for scratch work.

Show work for partial credit (if your response is incorrect).

technique w-sub What I want you to show me  $w = 5t, dw = 5dt, \int \frac{e^w}{5} dw$

(b) ...

2. Evaluate the following integrals and show work and/or reasoning, including limits—but only if they apply. If numbers need to be plugged in you don't need to simplify, ie  $\ln |5 - 3|$  or similar is ok here. If it is improper, do clarify whether the integral converges or diverges.

(a)  $\int xe^{5x} dx$

Show full work and/or reasoning in this section. You may assume and use anything on the Algebra, Geometry, Trigonometry and Derivative Review.

parts and then  $w$ -subs:

$u = x \quad v' = e^{5x}$

$u' = 1 \quad v = \frac{e^{5x}}{5}$  by  $w$ -subs  $w = 5x, dw = 5 dx$  so  $\int e^w \frac{dw}{5} = \frac{e^w}{5} = \frac{e^{5x}}{5}$

$uv - \int u'v dx = x \frac{e^{5x}}{5} - \int \frac{e^{5x}}{5} dx.$

Then  $w$ -subs  $w = 5x$  again:  $w = 5x, dw = 5 dx$  so  $\int \frac{e^w}{5} \frac{dw}{5} = \frac{e^w}{25} = \frac{e^{5x}}{25}$

So  $uv - \int u'v dx = x \frac{e^{5x}}{5} - \frac{e^{5x}}{25} + C.$

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