Written Work 2
Due: Saturday, January 23, 2021

1. For each set of integrals decide which of the following is needed to be able to solve the integral.: 1) Integration by Parts, 2) Substitution, 3) Algebra or a trig identity, 4) Nothing Needed (Can evaluate how it is written), or 5) Cannot be done by the techniques in Calculus I. Write which techinque is used to evaluate the integral. If there are multiple techniques you would use to evaluate the integral then state each technique. You **DO NOT** need to evaluate the integrals.

$\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\mathrm{d}x$	$\int \theta \csc^2(\theta)\mathrm{d}\theta$	$\int \frac{y^3+2y-3}{y^2-4}\mathrm{d}y$
$\int t^5 \sin(t^3)\mathrm{d}t$	$\int e^{3x}\cos 2x\mathrm{d}x$	$\int \frac{1}{1+x^2}\mathrm{d}x$
$\int \cos^3(t)\mathrm{d}t$	$\int \sqrt{1+\cos^2 x}\mathrm{d}x$	$\int \frac{z^3}{\sqrt{25-9z^2}}\mathrm{d}z$

2. Evaluate each of the following integrals. Show your steps and simplify your final answer. Leave all answers in exact form. (Note: You are not allowed to use the integral table when doing these problems.) (2nd Note: There are three integrals.)

(a) $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} \sin(4\theta)\cos^5(4\theta)\mathrm{d}\theta$

(b) $\int x\cos(x)\mathrm{d}x$

(c) $\displaystyle\int_0^4 p^3 e^{p^2}\,\mathrm{d}p$