

Homework 3 - Math 142**Name:** _____

Due by 5:00pm Friday, March 5. Send a PDF with your solutions to blins@hsc.edu.

1. Find the antiderivative of $\sqrt{e^x}$.
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2. Find the derivative of $(2/3)^x$.
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3. Compute $\frac{d}{dx} \frac{1}{1 + e^x}$.
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4. Compute $\int_0^\pi \cos x e^{\sin x} dx$.
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5. Find the inverse function $x = f^{-1}(y)$ for the functions below.

(a) $y = 1 + \frac{1}{x}$

(b) $y = 5x^3 + 2$

6. Show that the function $f(x) = \frac{x+1}{x-1}$ is its own inverse by simplifying $f(f(x))$.

7. Use a reference triangle to find $\sin(\sec^{-1}(\sqrt{5}))$

8. Use a reference triangle to simplify $\cos(\tan^{-1}(2x))$.

9. Find the derivative of $\sin^{-1}(x/2)$.

10. Compute $\frac{d}{dx} \tan^{-1}(e^x)$. Hint: Start with the formula for the derivative of $\tan^{-1}(x)$.
