MA 126 — Spring 2017 — Prof. Clontz — Standard Assessment 2

Name: _____

- Each question is prefaced with a Standard for this course.
- When grading, each response will be marked as follows:
  - ✓: The response is demonstrates complete understanding of the Standard.
  - ⋆: The response may indicate full understanding of the Standard, but clarification or minor corrections are required.
  - ×: The response does not demonstrate complete understanding of the Standard.
- Only responses marked with a ✓ mark count toward your grade for the semester. Visit the course website for more information on how to improve ⋆ and × marks.
- This Assessment is due after 50 minutes. All blank responses will be marked with ×.

C01: This student is able to... Derive properties of the logarithmic and exponential functions from their definitions.	Mark: (Instructor Use Only)

Show that $5^2 = 25$ follows from the definition $a^x = \exp(x \ln(a))$. (Hint: Use the fact that $\ln(z) + \ln(z) = \ln(z \times z)$.)

C02: This student is able to... Prove hyperbolic function identities.	Mark: (Instructor Use Only)

Use the definition

$$\cosh(x) = \frac{e^x + e^{-x}}{2}$$

to prove the following identity.

$$\cosh(2x) = 2\cosh^2(x) - 1$$

C03: This student is able to... Use integration by substitution.	Mark: (Instructor Use Only)

Show that $\int_2^3 x\sqrt{x-2}\,dx = \frac{26}{15}$.

S01: This student is able to... Find derivatives and integrals involving logrithmic and exponential functions.	Mark: (Instructor Use Only)

a) Find $\frac{d}{dz}[\ln(3e^z)]$.

b) Find $\int \left(2e + \frac{3}{y}\right)\, dy$.

S02: This student is able to... Find derivatives and integrals involving hypberbolic functions.	Mark: (Instructor Use Only)

a) Find $\frac{d}{dv}[4\tanh(3v) - \sinh(v^2)]$.

b) Find $\int (\cosh(x) + 2\sinh(x))\,dx$.

S03: This student is able to... Integrate products of trigonometric functions.	Mark: (Instructor Use Only)

Find $\int \sin^3(\theta)\cos^3(\theta)\,d\theta$.

S04: This student is able to... Use trigonometric substitution.	Mark: (Instructor Use Only)

Find $\int \frac{2}{1+4x^2}\,dx$.

S05: This student is able to... Use partial fractions to integrate rational functions.	Mark: (Instructor Use Only)

a) Complete the following partial fraction expansion:

$$\frac{f(x)}{(x+3)^3(x^2+7)^2} = \frac{A}{\quad} + \frac{B}{\quad} + \frac{C}{\quad} + \frac{Dx+E}{\quad} + \frac{Fx+G}{\quad}$$

(Assume the degree of f is less than 7. You do NOT need to solve for A through G.)

b) Find $\int \frac{8x^2-6x+14}{(x-1)(x^2+7)}\,dx$.

Use this space if you need extra room for a problem: