**UMass Boston - Math 140 - Summer 2007** **Guest Student**

WeBWorK assignment 17-Substitutions

**Due: 08/16/2007 at 10:00pm EDT**

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**1.** (1 pt) Evaluate the integral.

$\int x(x^2+1)^4\,dx =$ ______________.

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**2.** (1 pt) **Note:** You can get full credit for this problem by just entering the answer to the last question correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

Consider the indefinite integral $\int \cos^9(6t)\sin(6t)\,dt$

Then the most appropriate substitution to simplify this integral is

$u =$ ______ Then $dt = f(t)\,du$ where

$f(t) =$ ______

After making the substitution we obtain the integral $\int g(u)\,du$ where

$g(u) =$ ______

This last integral is: = ______ $+C$

(Leave out constant of integration from your answer.)

After substituting back for $u$ we obtain the following final form of the answer:

= ______ $+C$

(Leave out constant of integration from your answer.)

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**3.** (1 pt) **Note:** You can get full credit for this problem by just answering the last question correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

Consider the indefinite integral $\int x^7\left(5+10x^8\right)^9\,dx$

Then the most appropriate substitution to simplify this integral is

$u =$ ______

Then $dx = f(x)\,du$ where

$f(x) =$ ______

After making the substitution we obtain the integral $\int g(u)\,du$ where

$g(u) =$ ______

This last integral is: = ______ $+C$

(Leave out constant of integration from your answer.)

After substituting back for $u$ we obtain the following final form of the answer:

= ______ $+C$

(Leave out constant of integration from your answer.)

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**4.** (1 pt) **Note:** You can get full credit for this problem by just answering the last question correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

Consider the definite integral $\int_{\pi/6}^{\pi/2} \frac{\cos(z)}{\sin^5(z)}\,dz$

Then the most appropriate substitution to simplify this integral is

$u =$ ______

Then $dz = f(z)\,du$ where

$f(z) =$ ______

After making the substitution and simplifying we obtain the integral $\int_a^b g(u)\,du$ where

$g(u) =$ ______

$a =$ ______

$b =$ ______

This definite integral has value = ______

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**5.** (1 pt) **Note:** You can get full credit for this problem by just answering the last question correctly. The initial questions are meant as hints towards the final answer and also allow you the opportunity to get partial credit.

Consider the definite integral $\int_0^1 x^2\sqrt{8x+6}\,dx$

Then the most appropriate substitution to simplify this integral is

$u =$ ______

Then $dx = f(x)\,du$ where

$f(x) =$ ______

After making the substitution and simplifying we obtain the integral $\int_a^b g(u)\,du$ where

$g(u) =$ ______

$a =$ ______

$b =$ ______

This definite integral has value = ______