This WeBWorK assignment 235_Review is due : 01/11/2011 at 11:00am EST.

The purpose of this assignment is for you to review material from Math 235. Everything on this assignment is something you should already know how to do, and if not, then you should review it.

In Math 236 I will assume that you know how to do all of the things in this assignment. If you want to get started on the right foot in this course then do all of these problems until you get them correct and understand them.

This assignment is worth up to 20 points, based on how many problems you attempt and how many you successfully complete.

The primary purpose of WeBWorK is to let you know that you are getting the correct answer or to alert you if you are making some kind of mistake. You can attempt a problem as many times as you want before the due date. However, if you get an answer wrong then you should look up the technique in a book or online or ask a friend or tutor before trying to answer again. Don't spend a lot of time guessing – it's not very efficient or effective.

For most problems when entering numerical answers, you can if you wish enter elementary expressions such as $2 \wedge 3$ instead of 8, $sin(3*pi/2)$instead of -1, $e \wedge (ln(2))$ instead of 2, etc. Here's the **list of the functions** which WeBWorK understands.

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1. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C01S06-LogsInvs/1-6-27.pg**

Find a formula for the inverse of the function

$$f(x) = \ln(9x+3).$$

$f^{-1}(x)$ = ____________

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2. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C01S06-LogsInvs/1-6-39c.pg**

Select *True* or *False* for each statement.

You must get all of the answers correct to receive credit.

[?] $(\ln a)^{3b} = 3b \ln a$

[?] $\ln(x^a) = a + \ln x$

[?] $\log_a b^2 = (\log_a b)^2$

[?] $\ln \sqrt[3]{xy} = \frac{1}{3}(\ln x + \ln y)$

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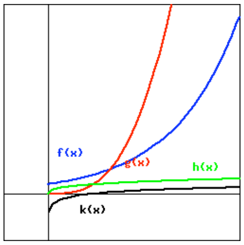
3. **(1 pt) Library/Michigan/Chap1Sec4/Q31.pg**



Without a calculator or computer, match the function 2^x, x^3, $\ln(x)/\ln(8)$ and $x^{1/3}$ to their graphs in the figure.

$f(x) =$ _______ (the blue curve)
$g(x) =$ _______ (the red curve)
$h(x) =$ _______ (the green curve)
$k(x) =$ _______ (the black curve)

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4. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C01S03-NewFunctOld-/1-3-42.pg**

Suppose that

$$f(x) = \frac{7}{x}, \quad g(x) = x^3, \quad \text{and} \quad h(x) = 8x^2 + 11.$$

Find $(f \circ g \circ h)(x)$.

$(f \circ g \circ h)(x)$ = ____________

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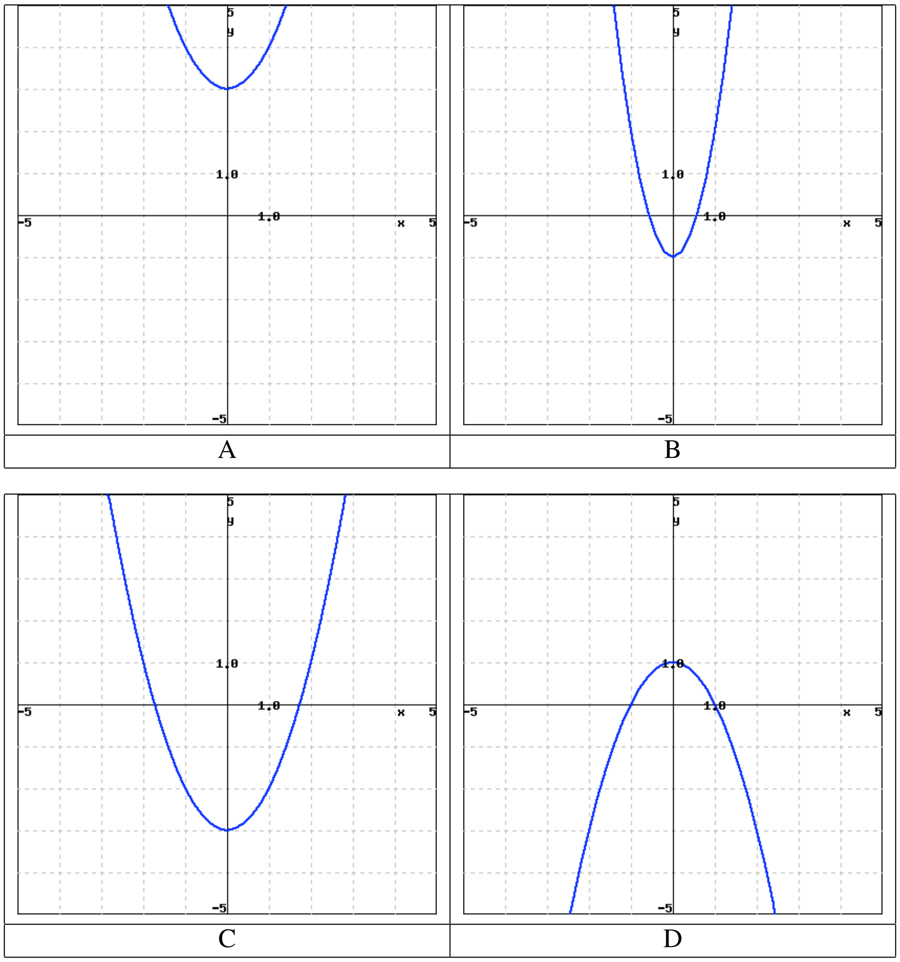
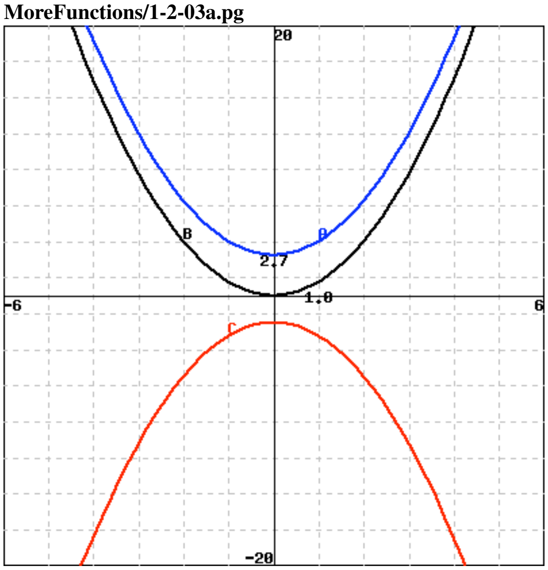
5. **(1 pt) Library/Rochester/setDerivatives22Graphing-/S04.03.DerivativesShapeGraph.PTP10.pg**

Use properties of functions to match each of the following functions with its graph. *Do not use your calculator.* Clicking on a graph will give you an enlarged view.

[?] 1. $f(x) = x^2 + 3$
[?] 2. $f(x) = -x^2 + 1$
[?] 3. $f(x) = x^2 - 3$
[?] 4. $f(x) = 3x^2 - 1$



6. (1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C01S02-MoreFunctions/1-2-03a.pg



Click on the graph to get a larger image of it.

Match the functions shown in the graph above with their formulas. Note, A is blue, B is black, and C is red.

___1. x^2
___2. x^2+3
___3. $-x^2-2$

7. (1 pt) Library/Rochester/setAlgebra15Functions-/S01.01.DomainNthRoot.PTP01.pg

Use **interval notation** to indicate the domain of

$$f(x)=\sqrt[4]{x^2-7x}$$

and

$$g(x)=\sqrt[5]{9x^2-4x}.$$

The domain of $f(x)$ is __________
The domain of $g(x)$ is __________

8. (1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C03S05-ChainRule/3-5-32a.pg

Let

$$f(x)=\sin(\cos(x^3))$$

$f'(x) =$ ____________

9. **(1 pt) Library/Union/setDervChainRule/an3_5_25.pg**
Let $f(x) = \frac{1}{x}\sin^3(6x)$. Find $f'(x)$.
$f'(x) =$ ____________

10. **(1 pt) Library/270/setDerivatives13Higher/ur_dr_13_12.pg**
Let

$$f(x) = 4\ln[\sec(x) + \tan(x)]$$

$f''(x) =$ ____________
HINT: Simplify the first derivative before you find the second derivative.

11. **(1 pt) Library/OSU/high_school_apcalc/dchmwk6/prob9.pg**
Consider the function $f(x) = 7x + 5x^{-1}$. For this function there are four important intervals: $(-\infty, A]$, $[A, B)$, (B, C), and $[C, \infty)$ where A, B and C are either critical numbers or points at which $f(x)$ is undefined.
Find A _____
and B _____
and C _____

12. **(1 pt) Library/ASU-topics/setSecondDerivative/4-3-75.pg**
Suppose that

$$f(x) = \frac{1}{3x^2 + 4}.$$

(A) Find the **smallest** inflection point of f.
Smallest inflection point: $x =$ ________

(B) Find the **largest** inflection point of f.
Largest inflection point: $x =$ ________

13. **(1 pt) Library/270/setIntegrals0Theory/sc5_2_28.pg**
Evaluate the integral by interpreting it in terms of areas. In other words, draw a picture of the region the integral represents, and find the area using high school geometry.

$$\int_0^7 |3x - 4|dx$$

____

14. **(1 pt) Library/270/setIntegrals0Theory/ur_in_0_13.pg**
Let $\int_{10}^{16} f(x)dx = 1$, $\int_{10}^{12} f(x)dx = 2$, $\int_{14}^{16} f(x)dx = 6$.
Find $\int_{12}^{14} f(x)dx =$ _____
and $\int_{14}^{12} (1f(x) - 2)dx =$ _____

15. **(1 pt) Library/270/setIntegrals0Theory/osu_in_0_15.pg**
The following sum

$$\frac{1}{1+\frac{3}{n}} \cdot \frac{3}{n} + \frac{1}{1+\frac{6}{n}} \cdot \frac{3}{n} + \frac{1}{1+\frac{9}{n}} \cdot \frac{3}{n} + \ldots + \frac{1}{1+\frac{3n}{n}} \cdot \frac{3}{n}$$

is a right Riemann sum for a certain definite integral

$$\int_1^b f(x)\,dx$$

using a partition of the interval $[1, b]$ into n subintervals of equal length.
Then the upper limit of integration must be: $b =$ ________

and the integrand must be the function $f(x) =$ ________

16. **(1 pt) Library/270/setIntegrals17Approximations/osu_in_17_4.pg**
Use the Midpoint Rule to approximate the integral

$$\int_{-9}^{-2} (-8x + 3x^2)dx$$

with n=3.
____

17. **(1 pt) Library/Utah/Calculus_I/set9_The_Definite_Integral-/c4s4p6.pg**
The value of $\int_4^9 \frac{1}{x^2}dx$ is
____

18. **(1 pt) Library/ma122DB/set12/s5_4_22.pg**
$\int_2^4 \frac{x^5 + 2}{x}\,dx =$ ________

19. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C05S04-IndefInts/5-4-06.pg**
Evaluate the indefinite integral:

$$\int \left(\frac{3}{\sqrt[3]{x}} - 8\sqrt[3]{x^2}\right) dx = \text{\_\_\_\_\_\_\_\_\_\_\_\_} + C.$$

20. **(1 pt) Library/UVA-Stew5e/setUVA-Stew5e-C05S04-IndefInts/5-4-05f.pg**
Evaluate the indefinite integral:

$$\int \frac{4 - 7xe^x}{x}\,dx = \text{\_\_\_\_\_\_\_\_\_\_\_\_} + C.$$

21. **(1 pt) Library/270/setIntegrals4FTC/c4s4p7.pg**
Given

$$f(x) = \int_0^x \frac{t^2 - 25}{1 + \cos^2(t)}dt$$

At what value of x does the local max of $f(x)$ occur?
$x =$ ________

22. **(1 pt) Library/OSU/high_school_apcalc/dchmwk3/prob2.pg**
If $f(x) = \frac{1}{x+2}$, find $f'(-5)$, using the definition of derivative. $f'(-5)$ is the limit as $x \to$ ______ of the expression

______

The value of this limit is ______

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23. **(1 pt) Library/270/setLimitsRates2Limits/s1_3_16.pg**
Evaluate the limit

$$\lim_{x\to -4} \frac{x^2+9x+20}{x+4}$$

______

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24. **(1 pt) local/270/setLimitsRates3Infinite/ur_lr_3_6.pg**

Evaluate the following limits.
(a)

$$\lim_{x\to\infty} \frac{2}{e^x+2} =$$

______

(b)

$$\lim_{x\to-\infty} \frac{2}{e^x+2} =$$

______
[NOTE: If needed, enter INF for ∞ and MINF for $-\infty$.]

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25. **(1 pt) Library/270/setLimitsRates3Infinite/s3_5_5.pg**
Evaluate the limit

$$\lim_{x\to\infty} \frac{(9-x)(6+8x)}{(3-5x)(8+6x)}$$

______

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26. **(1 pt) Library/LoyolaChicago/Precalc/Chap6Sec2/Q30.pg**

Let θ be an angle in the first quadrant, and suppose $\sin(\theta) = a$. Evaluate the following expressions in terms of a. For example, $\sin(\theta + 180^\circ) = -a$. *Your answers will be expressions that involve the letter a. Sketch a picture of the angles to help.*

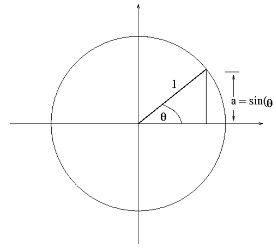
(a) $\sin(\theta + 360^\circ) =$ ______

(b) $\cos(90^\circ - \theta) =$ ______

(c) $\sin(180^\circ - \theta) =$ ______

(d) $\sin(360^\circ - \theta) =$ ______

(e) $\cos(270^\circ - \theta) =$ ______



(Click on graph to enlarge)

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27. **(1 pt) Library/270/setDerivatives20Antideriv/s3_10_8.pg**
Consider the function $f(x) = \frac{5}{x^3} - \frac{4}{x^6}$.
Let $F(x)$ be the antiderivative of $f(x)$ with $F(1) = 0$.
Then $F(2)$ equals ______

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28. **(1 pt) Library/ASU-topics/setAntiderivatives/6-1-70.pg**
Find the particular antiderivative that satisfies the following conditions:

$$\frac{dR}{dt} = \frac{20}{t^2}; \quad R(1) = 40.$$

$R =$ ______

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29. **(1 pt) Library/Rochester/setIntegrals19Area/ns6_1_25.pg**
Find the area of the region enclosed between $y = 2\sin(x)$ and $y = 2\cos(x)$ from $x = 0$ to $x = 0.7\pi$.
Hint: Notice that this region consists of two parts.
______

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30. **(1 pt) Library/ASU-topics/setRightAngleTrig/srw6_2_17.pg**
For the acute angle θ with $\sin\theta = 3/5$, find (give exact answers, NO DECIMALS)
$\cos\theta =$ ______.
$\tan\theta =$ ______.
$\cot\theta =$ ______.
$\sec\theta =$ ______.
$\csc\theta =$ ______.