UMass Boston - Math 140 - Summer 2007 **Guest Student**
WeBWorK assignment 00-PrecalculusReview
Due: 07/22/2007 at 10:00pm EDT

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1. (1 pt) The expression $(5b^2c^{-6})^1(3b^4a^{-4})^5$ equals $na^rb^sc^t$ where n, the leading coefficient, is: _____
and r, the exponent of a, is: _____
and s, the exponent of b, is: _____
and finally t, the exponent of c, is: _____
[NOTE: Your answers cannot be algebraic expressions.]

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2. (1 pt) The expression $\sqrt[3]{729g^5y^5}\sqrt{729g^5y^5}$ equals kx^ry^s
where r, the exponent of g, is: _____
and s, the exponent of y, is: _____
and k, the leading coefficient is: _____

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3. (1 pt) If you rationalize the denominator of

$$\frac{1}{7\sqrt{5}-4\sqrt{3}}$$

then you will get

$$\frac{r\sqrt{5}+s\sqrt{3}}{n}$$

where r, s, and n are all positive integers (with no common factors).
$r =$ _____
$s =$ _____
$n =$ _____
[NOTE: Your answers cannot be algebraic expressions.]

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4. (1 pt) Factor the trinomial $25x^2-50x+25$
$25x^2-50x+25 = (Ax-B)^2$
where A is ___ and B is ___.

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5. (1 pt) Factor the polynomial $x^2+4x-12$. Your answer can be written as $(x+A)(x+B)$ where $A<B$
and A equals: _____
and B equals: _____

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6. (1 pt)
Simplify the expression

$$\frac{2x-2}{x-2}+\frac{2-x}{x-2}$$

and give your answer in the form of

$$\frac{f(x)}{g(x)}.$$

Your answer for the function $f(x)$ is : _____
Your answer for the function $g(x)$ is : _____

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7. (1 pt) Match the expressions below with the letters labeling their equivalent expressions.
You must get all of the answers correct to receive credit.

___1. $\dfrac{\frac{x^3}{x^2+11x+30}}{\frac{x^5}{x+6}}$

___2. $\dfrac{\frac{x^5}{x+6}}{\frac{x^3}{x^2+11x+30}}$

___3. $\dfrac{\frac{x^5}{x^2+11x+30}}{\frac{x^3}{x+6}}$

___4. $\dfrac{\frac{x^3}{x+6}}{\frac{x^5}{x^2+11x+30}}$

A. $\dfrac{x+5}{x^2}$
B. $\dfrac{x^2}{x+5}$
C. $\dfrac{1}{x^2(x+5)}$
D. $x^2(x+5)$

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8. (1 pt) By completing the square, the expression $x^2+16x+189$ equals $(x+A)^2+B$
where $A =$ _____ and $B =$ _____

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9. (1 pt) The equation $x^2+4x-17=0$ has two solutions A and B where $A<B$
and $A =$ _____ and $B =$ _____

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10. (1 pt) Solve the following inequality. Write the answer in interval notation.
Note: If the answer includes more than one interval write the intervals separated by the "union" symbol, U. If needed enter ∞ as *infinity* and $-\infty$ as *-infinity* .

$$(x-1)(x+5)\leq 0$$

Answer: _____

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11. (1 pt) Solve the following inequality. Write the answer in interval notation.
Note: If the answer includes more than one interval write the intervals separated by the "union" symbol, U. If needed enter ∞ as *infinity* and $-\infty$ as *-infinity* .

$$\frac{4-x}{x-8}\geq 0$$

Answer: _____

12. (1 pt) Solve the following inequality. Write the answer in interval notation.
Note: If the answer includes more than one interval write the intervals separated by the "union" symbol, U. If needed enter ∞ as *infinity* and $-\infty$ as *-infinity* .

$$|x+6|<4$$

Answer: _____

13. (1 pt) Given the function

$$f(x)=\begin{cases} 7x-2 & \text{if} \quad x<0 \\ 7x-4 & \text{if} \quad x\geq 0 \end{cases}$$

Calculate the following values:
$f(-1)=$ _____
$f(0)=$ _____
$f(2)=$ _____

14. (1 pt) The domain of the function

$$\sqrt{\frac{7x}{x^2-256}}$$

is _____
Write the answer in interval notation.
Note: If the answer includes more than one interval write the intervals separated by the union symbol, U. If needed enter $-\infty$ as - *infinity* and ∞ as *infinity* .

15. (1 pt) The domain of the function $f(x)=\sqrt{24+2x-x^2}$ is the closed interval $[A,B]$ where A equals _____ and where B equals _____

16. (1 pt) Express the rule "Multiply by 24, then add 15" as the function
$f(x)=$ _____.

17. (1 pt) Given that $f(x)=8x-9$ and $g(x)=4x-6$, calculate
(a) $f\circ g(x)=$ _____
(b) $g\circ f(x)=$ _____
(c) $f\circ f(x)=$ _____
(d) $g\circ g(x)=$ _____

18. (1 pt) Given that $f(x)=5x+8$ and $g(x)=2-x^2$, calculate
(a) $f(g(0))=$ _____
(b) $g(f(0))=$ _____

19. (1 pt) Let

$$f(x)=\frac{1}{x+9}$$

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

20. (1 pt) Let

$$f(x)=\frac{x+1}{x+10}$$

$f^{-1}(-9)=$ _____

21. (1 pt) Evaluate the following expressions. Your answers must be exact and in simplest form.
(a) $\log_3\left(\frac{1}{243}\right)=$ _____
(b) $\log_6 1=$ _____
(c) $\log_7\sqrt{823543}=$ _____
(d) $14^{\log_{14}8}=$ _____

22. (1 pt) Rewrite the expression

$$\log_2 x+5\log_2 y-4\log_2 z$$

as a single logarithm $\log_2 A$. Then the function
$A=$ _____

23. (1 pt) Starting with the graph of $f(x)=8^x$, write the equation of the graph that results from
(a) shifting $f(x)$ 8 units upward. $y=$ _____
(b) shifting $f(x)$ 8 units to the left. $y=$ _____
(c) reflecting $f(x)$ about the x-axis. $y=$ _____

24. (1 pt) Evaluate the following expressions.
Note: Your answer must be in EXACT form: it cannot contain decimals. It must be either an integer or a fraction. If the answer involves a square root write it as *sqrt* . For instance, the square root of 2 should be written as sqrt(2).
$\sin(-\frac{\pi}{6})=$ _____
$\cos(-\frac{\pi}{3})=$ _____
$\tan(0)=$ _____
$\cot(-\frac{\pi}{2})=$ _____
$\sec(\frac{2\pi}{3})=$ _____
$\csc(\frac{\pi}{6})=$ _____

25. (1 pt) Evaluate the following.
Give your answer as a fraction, NO DECIMAL numbers.
If $\sin(\theta)=\frac{24}{25}$, $0\leq\theta\leq\pi/2$, then
$\cos(\theta)$ equals _____
$\tan(\theta)$ equals _____
$\sec(\theta)$ equals _____