

Name \_\_\_\_\_ DUE DATE: \_\_\_\_\_

**Directions:**

- Read each problem carefully and use your knowledge of mathematics to determine your answer.
- In order to receive FULL CREDIT you must either SHOW ALL WORK or EXPLAIN how you got your answer!! PLEASE NOTE: A multiple choice answer alone without any work will only receive half credit.

Question	Your Work/Explanation
1) Simplify: $\frac{\left(\frac{1-x}{4}\right)}{\left(3-\frac{4}{x}\right)}$	
2) Factor completely: $8x(x-3)^4 - 2x^2(x-3)^3$	
3) Which of the following expressions is equivalent to $\left(\frac{1}{2}a^3\right)^2 (4a^5)^3$ ? a) $2a^{13}$ b) $16a^{13}$ c) $2a^{21}$ d) $16a^{21}$	

<p>4) Find the horizontal asymptotes, if any, of the graph of <math>f(x) = \frac{3x^2 + 1}{3x^5 + 4}</math></p> <p>a) <math>y = 1</math>                      b) <math>y = 2</math> c) <math>y = 0</math>                        d) none</p>	
<p>5) Solve for <math>x</math>: <math>3\ln e^{2x+1} - 17 = 10</math></p> <p>a) <math>\frac{-1+\ln 9}{2}</math>                      b) <math>\frac{9}{2\ln e} - \frac{1}{2}</math> c) 23                              d) 4</p>	
<p>6) Multiply or find the special product: <math>(3x + y^7)^3</math></p> <p>a) <math>x^3 + 9x^2y^7 + 18xy^{14} + 3y^{21}</math> b) <math>27x^3 + 27x^2y^7 + 9xy^{14} + y^{21}</math> c) <math>27x^3 + 9x^2y^7 + 3xy^{14} + y^{21}</math> d) <math>27x^3 + y^{21}</math></p>	
<p>7) Evaluate <math>g(n - 2)</math> for the function <math>g(x) = \frac{x^2 - 6}{3x}</math> and simplify.</p>	

8) Solve for  $x$ :  $3^{1-x} = 5^x$

a)  $\ln \frac{1}{5}$

b)  $\ln \frac{3}{5}$

c)  $\frac{\ln 3}{\ln 15}$

d)  $(\ln 3)(\ln 15)$

9) Factor completely:  $6x^2 - 38x - 28$

10) Use the properties of logarithms to expand:  $\log_b \left( \frac{x^3 y^2}{\sqrt{w}} \right)$

a)  $x^3 + y^3 - \sqrt{w}$

b)  $\frac{1}{3} \log_b x + \frac{1}{2} \log_b y - 2 \log_b w$

c)  $3 \log_b x + 2 \log_b y - \frac{1}{2} \log_b w$

d)  $\frac{3 \log x + 2 \log y}{(1/2) \log w}$

11) Simplify:

$$7\sqrt{27x^5y^2} - 4x\sqrt{75x^3y^2} + 2x^2\sqrt{12xy^2}$$

12) Divide:  $(3x^4 - x + 1) \div (x^2 + 1)$

