

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
<p>1) Determine the domain of the function</p> $f(x) = \frac{8x}{x(x^2-16)}$ <p>(a) All real numbers <math>x \neq 16, x \neq 0</math></p> <p>(b) All real numbers <math>x \neq 4</math></p> <p>(c) All real numbers <math>x \neq -4, x \neq 4</math></p> <p>(d) All real numbers <math>x \neq -4, x \neq 4, x \neq 0</math></p>	
<p>2) Solve for <math>x</math>: <math>2^{3x+1} = 5</math></p>	
<p>3) How many real zeroes does the following polynomial function have?</p> $f(x) = -9x^4 + 81x^2$ <p>(a) one                      (b) two</p> <p>(c) three                    (d) four</p>	

- 4) For the graph of the following quadratic function, which of the following is the direction of the opening and the coordinates of the vertex?

$$f(x) = 2(x + 4)^2 + 2$$

- (a) downward; (-4, 2)  
(b) upward; (-4, 2)  
(c) downward; (4, -2)  
(d) upward; (4, -2)

- 5) Simplify the expression:  $\left(\frac{4x^{-3}}{5x^2}\right)^{-3}$

- (a)  $\frac{64}{125x^{15}}$                       (b)  $125x^{15}$   
(c)  $\frac{125x^{15}}{64}$                         (d)  $64x$

- 6) Find all the zeros of the function  
 $f(x) = x^4 + 9x^2 - 400$ .

- (a)  $\pm 4i, \pm 5$                       (b)  $\pm 4i, \pm 5i$   
(c)  $\pm 4, \pm 5i$                         (d)  $\pm 16i, \pm 2$

- 7) If  $f(x) = 7x - 6$  and  $g(x) = 5x - 3$ ,  
find  $(g \circ f)(1)$ .

- (a) 1                                      (b) 7  
(c) 2                                      (d) 8

8) Rationalize the denominator of the expression. Then simplify the answer.

$$\frac{10}{4 - \sqrt{5}}$$

(a)  $\frac{100}{21}$

(b)  $\frac{10\sqrt{5}}{4\sqrt{5} - 5}$

(c)  $\frac{40 + 10\sqrt{5}}{11}$

(d)  $\frac{40 + \sqrt{5}}{11}$

9) Find the first four terms of the sequence

$$a_n = \frac{4(-1)^n}{n+1}.$$

10) Find the range of  $f(x) = 2 - e^x$ .

11) Find the sum of  $\sum_{n=1}^5 \frac{3}{n+2}$

12) Find the partial fraction decomposition  
for  $\frac{4x - 27}{x^2 - 3x - 10}$ .