

NAME_____

Instructions: Write the answers where indicated and give clear evidence of your reasoning (or points will be taken off). You may attach extra sheets with your work if it is organized enough to be helpful. Graphs should be clearly labeled. **Calculators are not permitted if they can store formulae or do symbolic mathematics (algebra & calculus).** Graphing is OK.

NOTE: The lines "KEY FORMULA OR METHOD" are provided so that if you are not going to solve the problem completely, you can show that you have some correct idea. They are not required. All answers should be as specific as possible. A "specific expression" is one you could show to someone who knows calculus, so that person could evaluate it without being shown the original problem or told anything. It should contain no expressions like " $f(x)$," only specific functions like " $\sin(x)$."

SCORING - DO NOT WRITE ANSWERS ON THIS PAGE:

1 | _____

2 | _____

3 | _____

4 | _____

TOTAL _____

(COPYRIGHTED FAR SIDE CARTOON WAS DISTRIBUTED IN CLASS AS "FAIR USE.")

NAME_____

1 (10 points) Consider, **but do not graph**, the polar relationship

Check the symmetries and briefly explain:

The graph is (check one) ___symmetric/___antisymmetric/___neither about the vertical axis, because

The graph is (check one) ___symmetric/___antisymmetric/___neither about the horizontal axis, because

The graph is (check one) ___symmetric/___antisymmetric/___neither about the origin, because

KEY FORMULA OR METHOD (optional for partial credit)_____

2 (10 points)

Let $z = -8 + 8\sqrt{3}i$.

a) Find the polar coordinates of z : $r=$ _____ $=$ _____

b) How many numbers w are there satisfying $w^4 = z$?

ANSWER: There are _____ such numbers.

Evaluate (in rectangular coordinates $x=x+yi$):

c) One of the solutions w of $w^4 = z$: $w =$ _____

KEY FORMULA OR METHOD (optional for partial credit)_____

NAME _____

3 (10 points) Evaluate the following, if they exist. If they are divergent, state clearly why.

a) $\lim_{x \rightarrow 1^-} \frac{\sqrt{1-x^2}}{\sqrt{1-x^3}} =$ _____

Say....wasn't that problem 23 on p. 617?

For part b), express the decimal as an infinite sum, and use the result to write it as a quotient of whole numbers:

b) $4.234234234234\ldots =$ _____ \times _____ $=$ _____
 $k =$ _____

Are the following convergent or divergent

c) $\sum_{k=0}^{\infty} (-1)^k \frac{k^{2k}}{k! 2^k}$ is _____ convergent/_____ divergent, because

d) $\sum_{k=0}^{\infty} \frac{k!}{(k+2)! + \sqrt{k}}$ is _____ convergent/_____ divergent, because

KEY FORMULA OR METHOD (optional for partial credit) _____

4. (10 points)

a) $\sum_{k=0}^{\infty} \frac{k^{2k}}{k! 2^k} =$ _____

KEY FORMULA OR METHOD (optional for partial credit) _____
