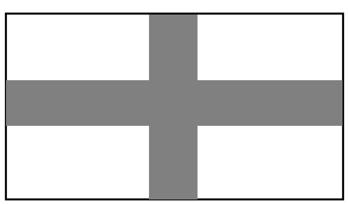
Math Analysis CP
WS 4.X- Section 4.1-4.4 Review

Complete each question without the use of a graphing calculator.

1. Compare the meaning of the words: roots, zeros and factors.
2. Determine whether -3 is a root of $x^3+3x^2+x+1=0$. Show your work.
3. Write a polynomial equation of least degree with roots 3, -1, 2*i*, and -2*i*. How many times does the graph of the related function intersect the x-axis?
4. What is the polynomial of least degree that has roots i, 0, 1?
5. Give an equation for a third degree polynomial that has roots at 3 and a double root at -2.
6. What do you know about the roots of a quadratic equation if its discriminant is 0?
7. Solve $3x^2+6x+2=0$ by completing the square.
8. Find the discriminant of $15x^2=4x-1$ and describe the nature of the roots of the equation. Then solve the equation using the quadratic formula.
9. How many times is -2 a root of $x^4-8x^2+16=0$?
10. Find the remainder of $\left(x^3-6x+9\right)\div(x-3)$ and state whether the binomial is a factor of the polynomial.
11. Find the remainder of $\left(x^4-6x^2+8\right)\div\left(x-\sqrt{2}\right)$ and state whether the binomial is a factor of the polynomial.
12. Find the value of k so that the remainder of $\left(x^3+5x^2-kx-2\right)\div(x+2)$ is 0.
13. Find k such that $(x-1)$ is a factor of $f(x)=x^4-x^3-2kx^2+3x-5$.
14. One of the factors of $2x^3-7x^2+4x-3$ is $x-3$. What is another factor?
15. List all the possible rational roots of $2x^4-x^3-6x+3=0$.
16. Find all the zeros of $f(x)=3x^3-x^2-6x+2$.
17. Find all the roots and factors of $a^4+a^2-2=0$.
18. Find all roots of the equation $-4x^4+3x^2+1=0$.
19. In the 6 x 8 rectangular garden, the paths (shaded), have equal widths. The garden's planting regions are shown as unshaded rectangles. If the total area of the shaded and unshaded regions is equal, how wide is each garden path?



Math Analysis CP
WS 4.X- Section 4.6-4.8 Review A

Do all work neatly and on a separate sheet of paper.

List all of the possible rational roots of each equation. Then find all solutions (both real and imaginary) of the equation.	***Solve each equation.***	***Solve each inequality.***
1. $x^3+4x^2+5x+2=0$	5. $\frac{15}{m}-m+8=10$	8. $\frac{6}{t}+3>\frac{2}{t}$
2. $2x^3-11x^2+10x+8=0$	6. $\frac{3a}{2a+1}-\frac{4}{2a-1}=1$	9. $1+\frac{3y}{1-y}>2$
3. $x^4-x^3-7x^2+x+6=0$	7. $\frac{2p}{p+1}+\frac{3}{p-1}=\frac{15-p}{p^2-1}$	10. $\frac{2x}{4}-\frac{5x+1}{3}>3$
4. $x^3-x^2+4=0$		

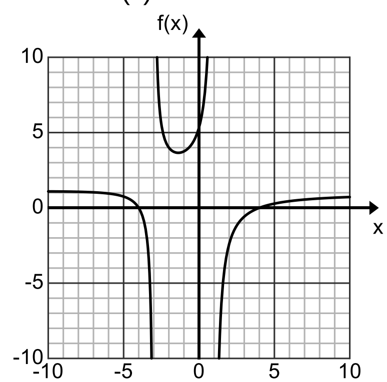
Math Analysis CP
WS 4.X- Section 4.6-4.8 Review B

1. Solve each equation or inequality:

a. $\frac{a}{a-2}+\frac{6}{a+2}=2$ b. $\frac{2}{w}+\frac{6}{w-1}\le -5$ c. $\frac{x^2-9}{2x^2+5x-3}\ge 0$

d. $\sqrt{2x+3}\le 2$ e. $\sqrt[3]{2m-1}=-3$ f. $\sqrt{a+1}-5=\sqrt{a+6}$

2. Use the graph of f(x) to solve f(x) < 0.



3. A Broadway theater sells 250 tickets for every performance. Each ticket costs $80. The company wants to increase the ticket price. They estimate that for each $3 increase in ticket price, 5 customers will be lost. Determine the ticket price that will allow the theater to increase its revenue by $1000.

4. Consider the data below:

x	-1	-0.5	0	.5	1	1.5
y	48.6	0.1	-9.3	-0.3	11.6	18.1
x	2	2.5	3	3.5	4	
y	14.6	6.4	0.4	12.2	63.8	

a. Sketch a scatter plot of the data.
b. What type of equation would best model this?
c. Find an equation f(x) to model the data.
d. Find the approx values of x for which f(x) = 1

Cumulative Algebra Review- Chapter 04
Analysis CP

All work is to be neatly shown on a separate piece of paper. Please write and box your answer, including the multiple choice answer letter. This is due the school day after the chapter test.

1. What is the equation of a line with a *y*-intercept of 3 and an *x*-intercept of -5?
(A) $y = 0.6x + 3$
(B) $y = 1.7x - 3$
(C) $y = 3x + 5$
(D) $y = 3x - 5$
(E) $y = -5x + 3$

2. If the second term in an arithmetic sequence is 4, and the tenth term is 15, what is the first term in the sequence?
(A) 1.18 (B) 1.27 (C) 1.38
(D) 2.63 (E) 2.75

3. If $f(x) = \frac{1}{2}x^2 - 6x + 11$, then what is the minimum value of $f(x)$?
(A) -8.0 (B) -7.0 (C) 3.2
(D) 6.0 (E) 11.0

4. What value does $\frac{x^2 - x - 6}{3x + 6}$ approach as *x* approaches -2?
(A) -1.67 (B) -0.60 (C) 0
(D) 1.00 (E) 2.33

5. If the greatest possible distance between two points in a rectangular solid is 12, then which of the following could be the dimensions of this solid?
(A) $3 \times 3 \times 3$
(B) $3 \times 6 \times 7$
(C) $3 \times 8 \times 12$
(D) $4 \times 7 \times 9$
(E) $4 \times 8 \times 8$

6. Runner A travels *a* feet every minute. Runner B travels *b* feet every second. In one hour, Runner A travels how much further than Runner B, in feet?
(A) $a - 60b$
(B) $a^2 - 60b^2$
(C) $360a - b$
(D) $60(a - b)$
(E) $60(a - 60b)$

7. If $f(x) = \frac{1}{x+1}$ and $g(x) = \frac{1}{x} + 1$, then $g(f(x)) =$
(A) 2
(B) $x + 2$
(C) $2x + 2$
(D) $\frac{x+2}{x+1}$
(E) $\frac{2x+1}{x+1}$

8. $\frac{x!}{(x-2)!} =$
(A) 0.5
(B) 2.0
(C) x
(D) $x^2 - x$
(E) $x^2 - 2x + 1$

9. In order to disprove the hypothesis "No number divisible by 5 is less than 5," it would be necessary to
(A) prove the statement false for all numbers divisible by 5
(B) demonstrate that numbers greater than 5 are often divisible by 5
(C) indicate that infinitely many numbers greater than 5 are divisible by 5
(D) supply one case in which a number divisible by 5 is less than 5
(E) show that a statement true of numbers greater than 5 is also true of numbers less than 5

10. The expression $\frac{x^2 + 3x + 4}{2x^2 + 10x + 8}$ is undefined for what value(s) of *x*?
(A) $x = \{-1, -4\}$
(B) $x = \{-1\}$
(C) $x = \{0\}$
(D) $x = \{1, -4\}$
(E) $x = \{0, 1, 4\}$

Written Response Question

A complete response requires the following:
- **Express** your thinking in words
- **Label** any figures you draw
- **Identify** any formulas used
- **Make clear** the source of numbers used

Full credit will not be earned if your work cannot clearly be followed. The final answer is important, but meaningless if you cannot show somebody how to get it.

Matt says that if *a* and *b* are any positive numbers, then $\sqrt{a^2 + b^2}$ must be smaller than $a + b$.

a. Choose three specific pairs of numbers to test Matt's statement.

b. Suppose $\sqrt{a^2 + b^2} = a + b$. Use algebra to determine what this implies about the value of *a* or *b*. Hint: Start by squaring both sides.

c. Based on what you discovered in part b, what can you determine about Matt's initial assumption about *a* and *b*?

d. For any triangle, the sum of the smaller two sides must be greater than the length of the third side. Using the given triangle, determine if Matt's statement is true or false.