

Math 4 Precalculus

Name: _____

Final Exam Outline

Cumulative Exam (Monday, 7/30/2009)

A "correct" answer without supporting work will receive only one point. Therefore it is essential that you show your work. The point value of each problem is listed to the left of that problem. The book problems listed below each problem (in yellow) will help you study for the problem. Most of the problems are odd so have answers to which you can compare yours. You can also find similar problems in the 3 exams.

- 1) Find the difference quotient $\frac{f(x+h) - f(x)}{h}$ and simplify completely (the h on the bottom should cancel out with a factor of h in the numerator). **FUNCTION GOES HERE**

pg.221: 43, 80

pg.241: 77, 79

- 2) Given the expression **MATH EXPRESSION GOES HERE**
- Factor** the calculus expression: (remember: factor out common factors with *lowest* power)
 - With this new expression, write final answer without negative exponents

pg.78,79: 77, 89, 93

3) Solve the following rational inequality. Write the solution set using interval notation.

INEQUALITY GOES HERE

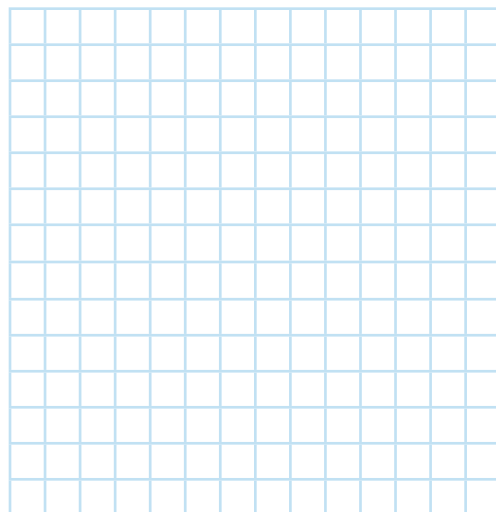
pg.373,374: 7, 23, 27, 29

4) Problem finding distance and midpoint between points and finding equation of a circle.

pg.204: 1, 2, 3, 8, 9

- 5) Given the quadratic function **QUADRATIC FUNCTION GOES HERE**
- write it in the vertex form
 - state the vertex and whether it is a maximum or minimum point.
 - write down in words, the transformations of the basic function $y = x^2$
(in the order the transformations happen).
 - graph the quadratic function using the transformations listed in part c.

pg.302: 23, 29, 31



- 6) Given the function **1st FUNCTION GOES HERE, 2nd FUNCTION GOES HERE** find
- $(f \circ g)(x)$ and simplify.
 - find the domain of $(f - g)(x)$. Use interval notation.

pg.220: 67(a-d), 68(a-d)

- 7) Factor and find zeros for
POLYNOMIAL FUNCTION GOES HERE
given that **REAL AND/OR COMPLEX ZERO GOES HERE** is a zero of the function.

pg.394: 11, 12, 27, 37

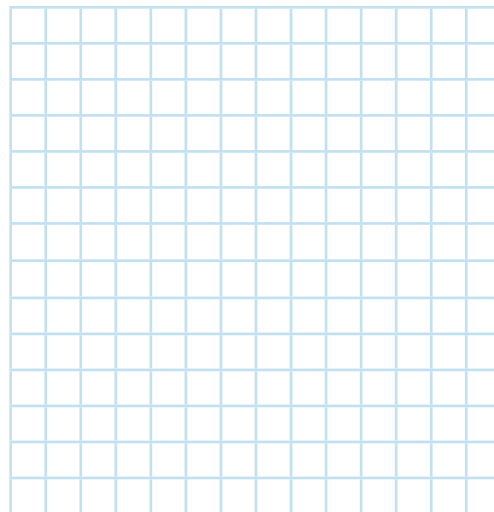
8) For the function

RATIONAL POLYNOMIAL FUNCTION GOES HERE

Find all

- a. holes
- b. vertical asymptotes
- c. horizontal asymptotes
- d. x-intercepts
- e. y-intercepts

And then graph it **labelling your findings** above on the graph.



pg.367: 9, 23, 29

9) Solve the following exponential and logarithmic equations.

a. **EXPONENTIAL EQUATION GOES HERE**

b. **LOGARITHMIC EQUATION GOES HERE**

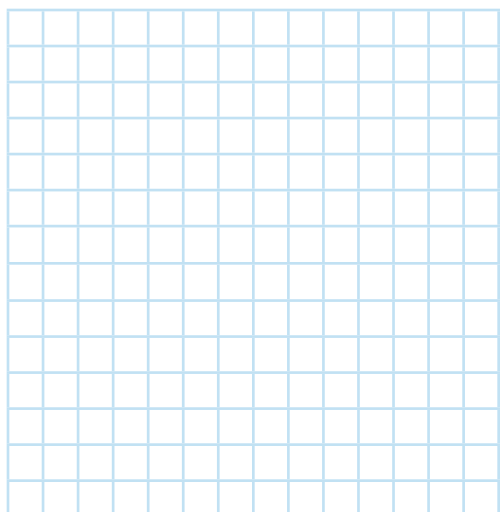
pg.498: 75, 71, 77, 78

pg.463: 17, 19

10) Graph the following exponential function

a. **EXPONENTIAL FUNCTION
GOES HERE**

b. Find $f^{-1}(x)$ **algebraically** and graph it on the same grid.



pg.498: 59(a-f), 61(a-f)

11) **APPLICATION INVOLVING EXPONENTIAL FUNCTION GOES HERE**

pg.499: 91, 93, 98

- 12) Calculate the exact value of the 6 trig functions if
a. problem like Exam 3 (problem 2)

pg.595: 33, 35

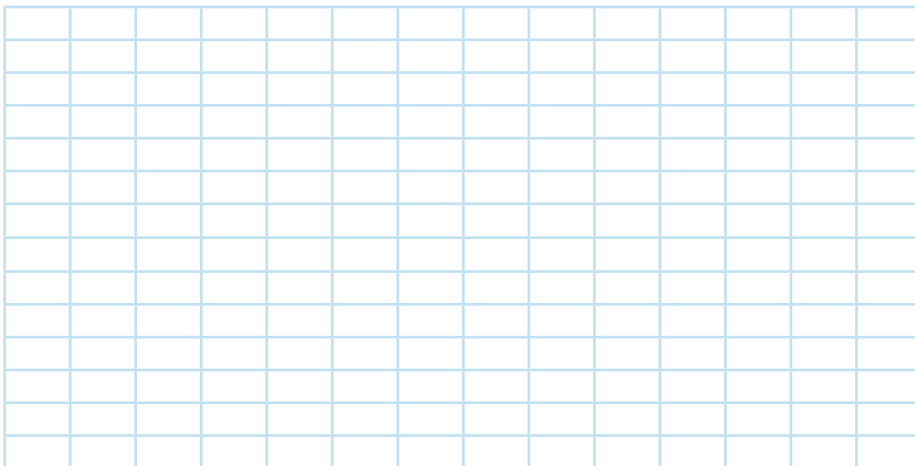
- (Note: show pictures whenever possible)
b.

pg.596: 84 but all 6 trig fcn's

- 13) Graph at least two periods of the function **TRIGONOMETRIC FUNCTION GOES HERE**

- a. Amplitude =
- b. Period =
- c. Phase Shift =
- d. Vertical Shift =
- e. Domain =
- f. Range =
- g. On graph label tick marks on axes

pg.595: 59, 61, 74



14) **APPLICATION INVOLVING TRIGONOMETRY GOES HERE**

Trig app like those found on
pg.596, 597: 93 – 97

15) Verify the following identities

a. **TRIG IDENTITY GOES HERE**

b. **TRIG IDENTITY GOES HERE**

identities like those found on
pg.665: 41 – 69

16) Find all solutions to the following trigonometric equations in the interval $[0, 2\pi)$:

a. **TRIG EQUATION GOES HERE**

b. **TRIG EQUATION GOES HERE**

pg.661, 662: 11, 23, 29, 41
pg.666: 116

these are practice for problem 17 also

17) Find ALL solutions to the equation
TRIG EQUATION GOES HERE

18) Calculate exact value of the following: (draw the right triangle in the when possible)
a. **COMPOSITION OF TRIG FCN WITH INVERSE TRIG FCN** b. **COMPOSITION OF INVERSE TRIG FCN WITH TRIG FCN**

pg.618, 619: 29, 36, 57, 59

19) Law of Sines/Cosines problem similar to problems discussed in class lecture.

20) Vector problem similar to problems discussed in class lecture.