

FINAL REVIEW WORKSHEET

Chapter 1: Can you...

- Compose functions? Meaning, given $f(x)$ and $g(x)$, could you determine $f(g(x))$ and $g(f(x))$?
- Evaluate a function at a value?
- Determine if a function is one-to-one?
- Determine the inverse of a function?
- Determine the domain/range of a function? Of a rational function?
- Graph piecewise functions?
- Describe transformations of a function?

<p>1. Given $f(x) = 2(x+1)^2$ and $g(x) = (x+3)(x-3)$</p> <ol style="list-style-type: none">Find $f \circ g$Determine $g(f(x))$Find $g(c^2 + 1)$Write $h(x)$ and $k(x)$ so that $f(x) = h(k(x))$Determine the domain of $f(x)$Is $f(x)$ one-to-one?	<p>2. Graph the function</p> $f(x) = \begin{cases} -4, & x \leq -2 \\ x - 2, & -2 < x < 2 \\ -2x + 4, & x \geq 2 \end{cases}$
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Chapter 2: Can you...

- Write the equation of a parabola in both vertex and quadratic form?
- Complete the square in order to determine the vertex of a parabola?
- Sketch the graph of a parabola?
- Determine if the vertex is a minimum or maximum value of the function?
- Find all solutions to a quadratic equation, both real and imaginary?
- Divide polynomial functions?
- Write a polynomial function given both real and imaginary zeros?
- Determine all of the roots (zeros) of a function given one of the zeros?
- Determine major characteristics of a rational function? This includes vertical asymptotes, horizontal asymptotes, holes, slant asymptotes, etc....
- Sketch the graph of a polynomial?
- Determine the end-behavior of a function?

<p>1. Find the vertex of each parabola. Then, determine if the vertex is a minimum or maximum value. Finally, find the zeros of the function.</p> <ol style="list-style-type: none">$f(x) = x^2 + 2x - 35$$f(x) = 4x^2 - 8x - 1$	<p>2. Sketch the graph of the polynomial</p> <ol style="list-style-type: none">$f(x) = -x^4 + 9x^2 - 20$
<p>3. Find the missing pieces of information given:</p> <ul style="list-style-type: none">• Point on the graph: (0, 9)• Vertex: (-2, 5) <ol style="list-style-type: none">Quadratic equationEquation in standard formX-interceptsgraph	<p>4. Divide $f(x) = x^4 + 7x^3 + 2x^2 + 3x + 14$ by $x + 2$</p>

5. Write the equation for a graph that has x-intercepts at $x = 6$ and $x = -3$, a vertical asymptote at $x = 2$ and a hole at $x = -2$ and $x = 1$. You can leave your answer as a product of linear factors.	6. Simplify to standard (a+bi) form: g. $f(x) = \frac{4+i}{4-i}$ h. $f(x) = \frac{5}{1+i} - \frac{3i}{1-i}$
7. Find the polynomial function with real coefficients that has -1 , 1 , and $2i$ as zeros.	8. Graph $f(x) = \frac{3x-3}{2x^2+2x-4}$. Give the x-int, y-int, V.A., H.A., slant, and holes.

Chapter 3: Can you...

- Evaluate log and natural log functions without a calculator?
- Rewrite exponential equations in logarithmic form?
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- Condense logarithmic expressions?
- Expand logarithmic expressions?
- Solve logarithmic and exponential equations?
- Graph exponential and logarithmic functions without a calculator?

1. Graph the following and find the domain/range, asymptotes, and intercepts a. $f(x) = 4 - e^{-2x}$ b. $f(x) = \log_3(x - 2) - 3$	2. Expand/Condense the logarithmic expressions with the properties of log 1. $\log_5 x w^2$ 2. $\frac{1}{2} \log_2 x + \log_2 u - 5 \log_2 z - 3 \log_2 y$
3. Find the exact value of $\log_{1/3} 27$	4. Rewrite $4^4 = 256$ in logarithmic form
5. Given that $\ln(3) = \ln(x - 2) - \ln(x)$, find the value of x.	

Chapter 4: Can you...

- Write degrees in radian form?
- Write radians in degree form?
- Solve a right triangle for a missing side?
- Determine which quadrant an angle falls in?
- Evaluate all six trigonometric functions of any angle?
- Determine a reference angle, θ' ?

1. Find the coterminal angle between 0 and 2π for the angle $\frac{-25\pi}{12}$	2. Given $\sin\theta = -\frac{2}{3}$ and that $\cos\theta > 0$, determine the remaining 5 trigonometric functions.
3. Given that $\sin\theta < 0$ and $\sec\theta < 0$, determine the quadrant in which you would find θ .	4. Given $\theta = \frac{5\pi}{3}$, determine the reference angle, θ' .

Chapter 7: Can you...

- Perform matrix operations (multiplication, addition, subtractions, etc....) with and without a calculator?
- Find the determinant of a 2x2 matrix with and without a calculator?
- Find the inverse of a 2x2 matrix with and without a calculator?

1. Perform the operations

$$\begin{bmatrix} 4 & 0 & -4 \\ 4 & -3 & -1 \end{bmatrix} \cdot \begin{pmatrix} 0 \\ -5 \\ -5 \end{pmatrix}$$

2. Determine the determinant

$$\begin{vmatrix} -2 & -5 \\ 3 & 4 \end{vmatrix}$$

3. Find the inverse

$$\begin{bmatrix} 9 & 9 \\ 9 & 8 \end{bmatrix}$$

