

Quiz 2 Review

This quiz will be very similar to Quiz 1 in the types and length of questions. You should be able to answer all of the questions below, as well as anything from Quiz 1, or prerequisite material. I will give you relevant equations **EXCEPT** the following:-

Quadratic Formula for solving roots: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Slope: $\frac{Y1 - Y2}{X1 - X2}$	$\frac{Y1 - Y2}{X1 - X2}$
Vertex form of a quadratic	$y = a(x - h)^2 + k$
Formula for the vertex (h,k)	$h = \frac{-b}{2a}, k = f\left(\frac{-b}{2a}\right)$

1. Be able to find a difference quotient. If $f(x) = 2x^2 - x + 7$, then find $\frac{f(x+h) - f(x)}{h}$.

2. Be able to **quickly sketch** all of the functions from the library of functions as well as various transformations. You should be able to determine the domains and ranges of all of these. This will include horizontal and vertical shifts, vertical/horizontal stretches and compressions, and reflections over both the x and y axis. For example graph the following and state their domains:

a. $y = 2(x - 1)^2 - 3$

b. $y = \frac{1}{2}\sqrt{x + 2}$

c. $y = -|x| + 3$

3. For a given quadratic function, be able to find the vertex, y-intercept, x-intercepts (roots), axis of symmetry, whether a graph opens up or down, etc. Also be able to determine what the max or the min of the graph is (hint: this is already one of the items in the list ☺). You may use the method of completing the square or the equations that solve for the vertex, but I will not give you these equations.

a. $y = 2x^2 - 4x + 5$

b. $y = x^2 + 12x + 32$

c. $y = -3x^2 - 12x - 8$

4. Be able to factor/solve equations of the following form:

a. $f(x) = 3x^2 - 16x + 20$

b. $f(x) = 2x^2 - 3x - 5$

c. $f(x) = x^4 + 5x^2 - 14$

5. Be able to solve a quadratic inequality. If $f(x) = 2x^2 + 2x + 2$ and $g(x) = x^2 - 2x - 1$, solve for when $f(x) \leq g(x)$? $f(x) > 0$?

6. Be able to solve for the complex roots of a quadratic equation.

7. If $z = 3 + 2i$ then what is its conjugate? What is $z\bar{z}$? Know the powers of i .

8. Be able to identify the characteristics of polynomial functions. For example if

$$f(x) = 3x^3(x - 1)^2(x + 4):$$

a. Determine multiplicity of the zeros. What will happen at these zero? Will it cross or touch?

b. What is the degree of the polynomial?

c. What is the power function of the polynomial?

d. How many turning points can this graph have?

e. What is the end behavior of this graph?

9. Know direct and indirect variation and be able to construct the relations ship.

a. M varies directly with the square root of x and inversely to the cube of d.

10. An application question.

If you need any more problems to help practice, check out any of the even problems from sections we have had homework from, chapter reviews, or you can email me with other questions. Good luck studying!