Algebra 2/Trig IB final 2019 outline

Part 1 No Calculator

- Find the zeros of a function (linear and/or rational functions)   [Ch. 1]
- Find a functions inverse   [Ch. 1]
- Solve a quadratic by completing the square   [Ch. 2]
- Given zeros of a polynomial, write the polynomial   [Ch. 2]
- Use polynomial long division and/or synthetic division to: [Ch. 2]
  - Divide polynomials
  - Write a polynomial as a product of factors
  - Find the zeros of a polynomial
- Solve non-linear inequalities   [Ch. 2]
- Graph logarithmic functions   [Ch. 3]
- Sketch an angle in standard position   [Ch. 4]
- Graph a sine and/or cosine function   [Ch. 4]

Part 2 Calculator Permitted

- Given a function, evaluate compositions   [Ch. 1]
  (exs: $f(g(x)), f + g(x), \ f \circ g(-2)$)
- Solve log equations   [Ch. 3]
- Solve exponential equations   [Ch. 3]
- Verify trig identities   [Ch. 5]
- Solve trig equations   [Ch. 5]

How to study:

- Practice problems from your notes, textbook (problems within the chapter or at the end if the sections), assignments, or tests. If you took good notes/kept assignments/quizzes/tests, you will have many problems to choose from as well as their worked out solutions. For the problems at the end of each section in your book, there are answers to all of the odd problems in the back

- Copy down problems found in places listed above, and create your own mini quiz for yourself

I have provided you with all of the info that will be on your final. It is not up to you to prepare using a combination of notes, assignments, tests, and homework. Please consider coming to the optional after school review sessions as well.

You will be GIVEN a formula sheet which will have (exactly) the following:

1.1	The nth term of an arithmetic sequence	$u_n = u_1 + (n-1)d$
	The sum of n terms of an arithmetic sequence	$S_n = \dfrac{n}{2}(2u_1 + (n-1)d) = \dfrac{n}{2}(u_1 + u_n)$
	The nth term of a geometric sequence	$u_n = u_1 r^{n-1}$
	The sum of n terms of a finite geometric sequence	$S_n = \dfrac{u_1(r^n - 1)}{r-1} = \dfrac{u_1(1-r^n)}{1-r}, \ r \neq 1$
	The sum of an infinite geometric sequence	$S_\infty = \dfrac{u_1}{1-r}, \ |r| < 1$
1.2	Exponents and logarithms	$a^x = b \ \Leftrightarrow \ x = \log_a b$
	Laws of logarithms	$\log_c a + \log_c b = \log_c ab$
		$\log_c a - \log_c b = \log_c \dfrac{a}{b}$
		$\log_c a^r = r \log_c a$
	Change of base	$\log_b a = \dfrac{\log_c a}{\log_c b}$
1.3	Binomial coefficient	$\dbinom{n}{r} = \dfrac{n!}{r!(n-r)!}$
	Binomial theorem	$(a+b)^n = a^n + \dbinom{n}{1}a^{n-1}b + \ldots + \dbinom{n}{r}a^{n-r}b^r + \ldots + b^n$

3.1	Length of an arc	$l = \theta r$
	Area of a sector	$A = \dfrac{1}{2}\theta r^2$
3.2	Trigonometric identity	$\tan\theta = \dfrac{\sin\theta}{\cos\theta}$
3.3	Pythagorean identity	$\cos^2\theta + \sin^2\theta = 1$
	Double angle formulae	$\sin 2\theta = 2\sin\theta\cos\theta$
		$\cos 2\theta = \cos^2\theta - \sin^2\theta = 2\cos^2\theta - 1 = 1 - 2\sin^2\theta$
3.6	Cosine rule	$c^2 = a^2 + b^2 - 2ab\cos C \ ; \ \cos C = \dfrac{a^2 + b^2 - c^2}{2ab}$
	Sine rule	$\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$
	Area of a triangle	$A = \dfrac{1}{2}ab\sin C$

2.4	Axis of symmetry of graph of a quadratic function	$f(x) = ax^2 + bx + c \ \Rightarrow \ \text{axis of symmetry } x = -\dfrac{b}{2a}$
2.6	Relationships between logarithmic and exponential functions	$a^x = e^{x\ln a}$ $\log_a a^x = x = a^{\log_a x}$
2.7	Solutions of a quadratic equation	$ax^2 + bx + c = 0 \ \Rightarrow \ x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}, \ a \neq 0$
	Discriminant	$\Delta = b^2 - 4ac$

(0, 1)

90° $\dfrac{\pi}{2}$

$(\dfrac{1}{2}, \dfrac{\sqrt{3}}{2})$

60° $\dfrac{\pi}{3}$

$(\dfrac{\sqrt{2}}{2}, \dfrac{\sqrt{2}}{2})$

45° $\dfrac{\pi}{4}$

$(\dfrac{\sqrt{3}}{2}, \dfrac{1}{2})$

30° $\dfrac{\pi}{6}$

0, 2π   0°   (1, 0)