AICE Math I - Summer Review

I. Coordinate Geometry:

Given the points A(-2, 3) and B(3, -7):

1. Find the slope and equation of the line AB.
2. The slope of the line parallel.
3. The slope of the line perpendicular.
4. The midpoint of segment AB.
5. The length of the segment AB.

II. Functions:

Given the function $f(x) = x^2 - 4x + 5$

1. Rewrite the equation in vertex form.
2. State the coordinates of the vertex.
3. Find the axis of symmetry.
4. Sketch the parabola and state the domain and range.
5. Find the x and y-intercepts.
6. Find the inverse of the function.

III. Inequalities:

Solve the inequalities.

1. $x^2 - 9 < 0$
2. $x^2 - x - 6 \geq 0$

IV. Sequences and Series

Given the arithmetic sequence 7, 13, 19, . . . the values indicated:

1. Write an equation for the sequence
2. The number term for 277
3. The 10^{th} term sequence
4. Find the sum the first 12 terms.

Given the geometric sequence 32/9, 16/3, 8, . . .

1. Write an equation for the sequence.
2. Find the 10^{th} term.
3. Find the sum of the first 10 terms.

V. Exponents and Radicals

Write the exponent as a radical and the radical as an exponent.

1. $(2xy)^{\frac{3}{2}}$
2. $\sqrt[3]{5x^2}$

VI. Trigonometry:

Solve the equations over the interval $0 \le x < 2\pi$

1. $2\cos x \cdot \sin x - \cos x = 0$
2. $\tan^2 x - \tan x = 2$

Prove the trigonometric Identities

3. $\dfrac{1-\sin x}{\cos x} \equiv \dfrac{\cos x}{1+\sin x}$
4. $\dfrac{1}{\tan \vartheta} + \tan \vartheta \equiv \dfrac{1}{\sin \vartheta \cos \vartheta}$

Change the units of the angles.

5. Find the degree for 6π/5 rad.
6. Find the radians for 215°.

Know your unit circle!

7. tan (π/3)
8. cos (-π/6)
9. sin (5π/4)

Graph 2 periods of the trig functions.

10. y = sin (2x)
11. y = 3 cos (x)
12. y = - tan (x)

VII. Composite Functions

Given the functions f(x) = 2x – 5, g(x) = x^2 + 1, h(x) = -x + 3, find the values below.
fg (x) = f(g(x))

1. fg (x)
2. gh(x)
3. hf (3)
4. gf (-7)