PRE-CALCULUS GRADE 12 FORMULA PAGE

The following information may be useful when writing this examination.

Trigonometry

$$a = r\theta$$

$$\csc\theta = \frac{1}{\sin\theta} \qquad \sec\theta = \frac{1}{\cos\theta}$$

$$\cot\theta = \frac{1}{\tan\theta} \qquad \tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$\cot\theta = \frac{\cos\theta}{\sin\theta}$$

$$\sin^2\theta + \cos^2\theta = 1$$

$$\tan^2\theta + 1 = \sec^2\theta$$

$$1 + \cot^2\theta = \csc^2\theta$$

$$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$$

$$\sin(\alpha-\beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$$

$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

$$\cos(\alpha-\beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$$

$$\tan(\alpha+\beta) = \frac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}$$

$$\tan(\alpha-\beta) = \frac{\tan\alpha - \tan\beta}{1 + \tan\alpha\tan\beta}$$

$$\sin 2\theta = 2\sin\theta\cos\theta$$

$$\cos 2\theta = \cos^2\theta - \sin^2\theta$$

$$= 2\cos^2\theta - 1$$

$$= 1 - 2\sin^2\theta$$

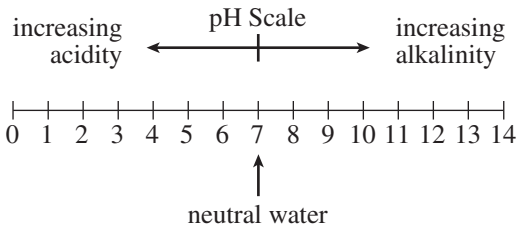
$$\tan 2\theta = \frac{2\tan\theta}{1 - \tan^2\theta}$$

Algebra

For $ax^2 + bx + c = 0$, $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Logarithms

In chemistry, the pH scale measures the acidity (0 < 7), alkalinity (7 > 14), and neutrality (7) of a solution. It is a logarithmic scale in base 10. Thus, a solution of pH of 9 is 10 times more alkaline than a solution of pH of 8.



Permutations and Combinations

$$_nP_r = \frac{n!}{(n-r)!}$$

$$_nC_r = \binom{n}{r} = \frac{n!}{r!(n-r)!}$$

In the expansion of $(a + b)^n$, the general term is

$$t_{k+1} = {}_nC_k\, a^{n-k}\, b^k$$

ROUGH WORK SPACE FOR GRAPHING

(No marks will be given for work done on this page.)