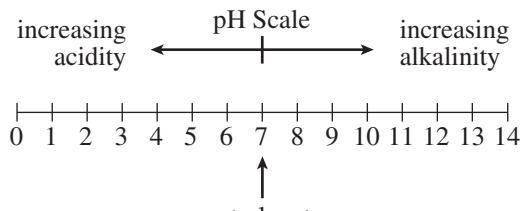


## PRE-CALCULUS GRADE 12 FORMULA PAGE

The following information may be useful when writing this examination.

Trigonometry	Algebra
$a = r\theta$	
$\csc \theta = \frac{1}{\sin \theta}$	$\sec \theta = \frac{1}{\cos \theta}$
$\cot \theta = \frac{1}{\tan \theta}$	$\tan \theta = \frac{\sin \theta}{\cos \theta}$
$\cot \theta = \frac{\cos \theta}{\sin \theta}$	
$\sin^2 \theta + \cos^2 \theta = 1$	
$\tan^2 \theta + 1 = \sec^2 \theta$	
$1 + \cot^2 \theta = \csc^2 \theta$	
$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$	
$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$	
$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$	
$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$	
$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$	
$\tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$	
$\sin 2\theta = 2 \sin \theta \cos \theta$	
$\cos 2\theta = \cos^2 \theta - \sin^2 \theta$	
$= 2 \cos^2 \theta - 1$	
$= 1 - 2 \sin^2 \theta$	
$\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$	
Algebra	Logarithms
	For $ax^2 + bx + c = 0$ , $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Logarithms	Permutations and Combinations
	<p>In chemistry, the pH scale measures the acidity (<math>0 &lt; 7</math>), alkalinity (<math>7 &gt; 14</math>), and neutrality (<math>7</math>) 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.</p> 
	${}_n P_r = \frac{n!}{(n-r)!}$ ${}_n C_r = \binom{n}{r} = \frac{n!}{r!(n-r)!}$ <p>In the expansion of <math>(a + b)^n</math>, the general term is</p> $t_{k+1} = {}_n C_k a^{n-k} b^k$