**MAWA FORMULA SHEET FOR MATHEMATICS METHODS (Unit 1)**

**Functions and graphs**

**Binomial distribution** $\left(x+y\right)^{n}=x^{n}+\left(\begin{matrix}n\\1\end{matrix}\right)x^{n-1}y+\cdots +\left(\begin{matrix}n\\r\end{matrix}\right)x^{n-r}y^{r}+\cdots +y^{n}$

**Completing the square** $ax^{2}+bx+c$ = $a\left(x+\frac{b}{2a}\right)^{2}+\left(c-\frac{b^{2}}{4a}\right)$

**Discriminant** $∆$ **=** $b^{2}-4ac$

**Quadratic formula** $x=\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$

**Trigonometric functions**

**Angle sum and difference identites** $\sin(\left(A\pm B\right))=\sin(A\cos(B)\pm )\cos(A\sin(B))$

 $\cos(\left(A\pm B\right)=\cos(A\cos(B\mp \sin(A\sin(B)))))$

**Area of a sector** $A=\frac{1}{2}r^{2}θ$

**Area of a segment** $A=\frac{1}{2}r^{2}(θ-\sin(θ))$

**Length of an arc** $l=rθ$

**Length of a chord** $l$ $=2r\sin(\frac{1}{2}θ)$

**Sine rule** $\frac{a}{\sin(A)}=\frac{b}{\sin(B)}=\frac{c}{\sin(C)}$

**Cosine rule** $c^{2}=a^{2}+b^{2}-2ab\cos(C)$

**Counting and probability**

**Probability** *P*(*A*) = 1- *P*(*A*)

*P*(*A*$∪$ *B*) = *P*(*A*) + *P*(*B*) − *P*(*A*$∩$*B*)

*P*(*A*$∩$ *B*) = *P*(*A*) *P*(*B* | *A*) = *P*(*B*) *P*(*A* | *B*)

**Conditional probability** $P(A|B)=\frac{P(A∩B)}{P(B)}$