

Prior learning		Topic 1 Number and Algebra																																									
Area of a parallelogram	$A = bh$ $b = \text{base}, h = \text{height}$	The n^{th} term of A.S.	$u_n = u_1 + (n - 1)d$																																								
Area of a triangle	$A = \frac{1}{2}bh$	The sum of n terms of A.S.	$S_n = \frac{n}{2}(2u_1 + (n - 1)d) = \frac{n}{2}(u_1 + u_n)$																																								
Area of a trapezium	$A = \frac{1}{2}(a + b)h$ $a, b = \text{parallel sides}, h = \text{height}$	The n^{th} terms of G.S.	$u_n = u_1r^{n-1}$																																								
Area of a circle	$A = \pi r^2, r \text{ is radius}$	The sum of n terms of G.S.	$S_n = \frac{u_1(r^n - 1)}{r - 1} = \frac{u_1(1 - r^n)}{1 - r}, r \neq 1$																																								
Circumference of a circle	$C = 2\pi r, r \text{ is radius}$	Percentage error	$\mathcal{E} = \left \frac{V_A - V_E}{V_E} \right \times 100\%$, where V_E is the exact value and V_A is the approximate value of v																																								
Two points distance	$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$	Compound interest	$FV = PV \times \left(1 + \frac{r}{100k}\right)^{kn}$, where $FV = \text{future value}, PV = \text{present value},$ $n = \text{number of years}, k = \text{number of compounding periods per year},$ $r\% = \text{nominal annual rate interest}$																																								
Midpoint	$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$																																										
Topic 2 Descriptive statistics		Topic 3 Logic, sets and probability																																									
Mean of a set of data	$\bar{x} = \frac{\sum_{i=1}^k f_i x_i}{n}$, where $n = \sum_{i=1}^k f_i$	Truth tables	<table border="1"> <thead> <tr> <th>p</th> <th>q</th> <th>$\neg p$</th> <th>$p \wedge q$</th> <th>$p \vee q$</th> <th>$p \vee \neg q$</th> <th>$p \Rightarrow q$</th> <th>$p \Leftrightarrow q$</th> </tr> </thead> <tbody> <tr> <td>T</td> <td>T</td> <td>F</td> <td>T</td> <td>T</td> <td>F</td> <td>T</td> <td>T</td> </tr> <tr> <td>T</td> <td>F</td> <td>F</td> <td>F</td> <td>T</td> <td>T</td> <td>F</td> <td>F</td> </tr> <tr> <td>F</td> <td>T</td> <td>T</td> <td>F</td> <td>T</td> <td>T</td> <td>T</td> <td>F</td> </tr> <tr> <td>F</td> <td>F</td> <td>T</td> <td>F</td> <td>F</td> <td>F</td> <td>T</td> <td>T</td> </tr> </tbody> </table>	p	q	$\neg p$	$p \wedge q$	$p \vee q$	$p \vee \neg q$	$p \Rightarrow q$	$p \Leftrightarrow q$	T	T	F	T	T	F	T	T	T	F	F	F	T	T	F	F	F	T	T	F	T	T	T	F	F	F	T	F	F	F	T	T
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Interquartile range	$IQR = Q_3 - Q_1$	Probability of an event A	$P(A) = \frac{n(A)}{n(U)}$																																								
		Complementary events	$P(A') = 1 - P(A)$																																								
		Combined events	$P(A \cup B) = P(A) + P(B) - P(A \cap B)$																																								
		Mutually exclusive events	$P(A \cap B) = 0$																																								
		Independent events	$P(A \cup B) = P(A)P(B)$																																								
		Conditional probability	$P(A B) = \frac{P(A \cap B)}{P(B)}$																																								

Topic 5 Geometry and trigonometry		Topic 6 Mathematical models	
Straight line equation	$y = mx + c ; ax + by + d = 0$	Axis of symmetry	$f(x) = ax^2 + bx + c \rightarrow x = \frac{-b}{2a}$
Gradient formula	$m = \frac{y_2 - y_1}{x_2 - x_1}$	Topic 7 Introduction to differential calculus	
Cosine rule	$c^2 = a^2 + b^2 - 2ab \cos C$ $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$	Derivative of x^n	$f(x) = x^n \rightarrow f'(x) = nx^{n-1}$
Sine rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	Derivative of a sum	$f(x) = ax^n, g(x) = bx^m$ $\rightarrow f'(x) + g'(x)$ $= nax^{n-1} + mbx^{m-1}$
Area of a triangle	$A = \frac{1}{2}ab \sin C$		
Area of the curved surface of a cylinder	$A = 2\pi rh$		
Surface area of a sphere	$A = 4\pi r^2$		
Curved surface area of a cone	$A = \pi rl$, where l is the slant height		
Volume of a pyramid or cone	$V = \frac{1}{3}$ x base area x vertical height		
Volume of a cuboid	$V = lwh$		
Volume a cylinder	$V = \pi r^2 h$		
Volume of a sphere	$V = \frac{4}{3}\pi r^3$		
Volume of a prism	$V = Ah$, where A is the area of cross-section, h is the height		