CONCEPT MAP

FORM 5

TRIGONOMETRIC FUNCTIONS

Positive angles and negative angles

Six trigonometric functions of any angle

$\sin\theta$, $\cos\theta$, $\tan\theta$
$\cot\theta$, $\sec\theta$, $\text{cosec}\,\theta$

Trigonometric ratios of special angles 30°, 45°, 60°

Three basic identities

$\sin^2 A + \cot^2 A = 1$
$\tan^2 A + 1 = \sec^2 A$
$1 + \cot^2 A = \text{cosec}^2 A$

Compound angle formulae

$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$
$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$
$\tan(A \pm B) = \dfrac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$

Double angle formulae

$\sin 2A = 2 \sin A \cos A$
$\cos 2A = \cos^2 A - \sin^2 A$
$= 2\cos^2 A - 1$
$= 1 - 2\sin^2 A$
$\tan 2A = \dfrac{2\tan A}{1 - \tan^2 A}$

Half-angle formulae

- $\sin A = 2\sin\dfrac{A}{2}\cos\dfrac{A}{2}$
- $\cos A = \cos^2\dfrac{A}{2} - \sin^2\dfrac{A}{2}$
  $= 2\cos^2\dfrac{A}{2} - 1$
  $= 1 - 2\sin^2\dfrac{A}{2}$
- $\tan A = \dfrac{2\tan\frac{A}{2}}{1 - \tan^2\frac{A}{2}}$

Graphs of trigonometric functions

$y = p\sin qx$
$y = p\cos qx$
$y = p\tan qx$

Proving trigonometric identities

Solving trigonometric equations