Extra formulae you should know

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

$\tan^2\theta + 1 = \sec^2\theta$ (divide by $\cos^2\theta \rightarrow \tan^2\theta + 1 = \sec^2\theta$)

$1 + \cot^2\theta = \operatorname{cosec}^2\theta$ (divide by $\sin^2\theta \rightarrow 1 + \cot^2\theta = \operatorname{cosec}^2\theta$)

$\sin(A \pm B) = \sin A\cos B \pm \cos A\sin B$

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

$\sin 2A = 2\sin A\cos A$

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

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

$\cos 2A = 1 - 2\sin^2 A$

Wave Equation

$R\cos(x-\alpha) = R\cos x\cos\alpha + R\sin x\sin\alpha$

Compare coefficients to obtain:

$R\cos\alpha = ...$

$R\sin\alpha = ...$

Square and add to get: $R^2(\cos^2\alpha + \sin^2\alpha) = (....)^2 + (....)^2$

$R = \sqrt{(....)^2 + (....)^2}$

Divide to get:

$$\frac{R\sin\alpha}{R\cos\alpha} = \frac{(.....)}{(.....)} \Rightarrow \tan\alpha = \frac{(.....)}{(.....)}$$

All formulae from Higher.