Derivations: Prove each formula. Recall previous formulas and identities in your work.

(Sum and Difference Formula): $\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$

(Sum and Difference Formula): $\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta$

(Double-Angle Formula): $\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$

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

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

(Double-Angle Formula): $\sin 2\alpha = 2\sin\alpha\cos\alpha$

(Double-Angle Formula). $\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha}$

(Half-Angle Formula). $\sin\frac{\alpha}{2} = \pm\sqrt{\frac{1-\cos\alpha}{2}}$

(Half-Angle Formula). $\cos\frac{\alpha}{2} = \pm\sqrt{\frac{1+\cos\alpha}{2}}$

(Half-Angle Formula). $\tan\frac{\alpha}{2} = \pm\sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}}$

$\tan\frac{\alpha}{2} = \frac{\sin\alpha}{1+\cos\alpha}$

$\tan\frac{\alpha}{2} = \frac{1-\cos\alpha}{\sin\alpha}$