

JOHNSON COUNTY COMMUNITY COLLEGE

Precalculus Final Exam

Trigonometric Identities

Double-angle formulas

$$\sin 2t = 2 \sin t \cos t$$

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

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

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

$$\tan 2t = \frac{2 \tan t}{1 - \tan^2 t}$$

Sum-of-angle and difference-of-angle formulas

$$\sin(\theta + \phi) = \sin \theta \cos \phi + \cos \theta \sin \phi$$

$$\sin(\theta - \phi) = \sin \theta \cos \phi - \cos \theta \sin \phi$$

$$\cos(\theta + \phi) = \cos \theta \cos \phi - \sin \theta \sin \phi$$

$$\cos(\theta - \phi) = \cos \theta \cos \phi + \sin \theta \sin \phi$$

Sum and difference of sine and cosine

$$\cos u + \cos v = 2 \cos \frac{u+v}{2} \cos \frac{u-v}{2}$$

$$\cos u - \cos v = -2 \sin \frac{u+v}{2} \sin \frac{u-v}{2}$$

$$\sin u + \sin v = 2 \sin \frac{u+v}{2} \cos \frac{u-v}{2}$$

$$\sin u - \sin v = 2 \cos \frac{u+v}{2} \sin \frac{u-v}{2}$$