$$\sin 2\alpha = 2 \sin \alpha \cos \beta$$

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

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

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

$$tg \, 2\alpha = \frac{2tg \, \alpha}{1 - tg^2 \alpha}$$

## 1. Вычислите:

a) 
$$\cos \frac{7\pi}{2} + 10\cos \frac{\pi}{6} - 100\sin \frac{5\pi}{6}$$

б) 
$$\cos \left(-\frac{3\pi}{2}\right) + 20tg\frac{\pi}{6} - 40ctg\frac{5\pi}{6}$$

B) 
$$\cos\left(-\frac{19\pi}{6}\right) + 10\sin\left(-\frac{25\pi}{6}\right)$$

$$\Gamma$$
) tg $\left(-\frac{\pi}{6}\right)$  + ctg $\left(\frac{\pi}{3}\right)$ 

## 2. Вычислите:

a) 
$$sin22,5^{\circ} * cos22,5^{\circ}$$

б) 
$$sin15^{0}$$

B) 
$$\cos^2 15^0 - \sin^2 15^0$$

$$\Gamma)\,\frac{cos25^0*sin25^0}{sin50^0}$$

$$_{\rm J}$$
)  $cos^275^0 + sin^275^0$ 

e) 
$$tg\left(\frac{\pi}{6}\right) * tg\left(\frac{\pi}{3}\right)$$

ж) 
$$sin\left(\frac{31\pi}{8}\right)*cos\left(\frac{31\pi}{8}\right)$$

и) 
$$(\cos\frac{13\pi}{8} + \sin\frac{13\pi}{8})^2$$

$$\kappa) \sqrt{6} - \sqrt{24} \cos^2 \left(\frac{11\pi}{8}\right)$$

3. Найдите  $\operatorname{tg} \alpha$ ,  $\sin 2\alpha$ ,  $\cos 2\alpha$ , если  $\cos \alpha = 0.8$ ,  $\alpha$ 

4. Упростите выражение:

a) 
$$\sin 2\alpha + (\sin \alpha - \cos \alpha)^2$$

б) 
$$\sin 2\alpha * \operatorname{ctg}\alpha - 1$$

$$\mathrm{B}\big)\frac{2sin\alpha-sin2\alpha}{1-cos\alpha}$$

$$\Gamma)\,\frac{cos2\alpha-cos^2\alpha}{1-cos^2\alpha}$$

д) 
$$(\cos 3\alpha + \sin 3\alpha)(\cos 3\alpha - \sin 3\alpha)$$

e) 
$$1 - 2sin^2 4\alpha$$

- 5. Найдите  $\sin 2\alpha$ , если  $\sin \alpha + \cos \alpha = 0.5$
- 6. Докажите тождество

$$\frac{sin3\alpha}{sin\alpha} - \frac{cos3\alpha}{cos\alpha} = 2$$