$$E(a+bY) = a + bE(Y)$$

$$\text{var}(\cancel{a}+bY) = b^2\,\text{var}(Y)$$

$$a+bY = -\lambda^2 Y$$

$$a = 0$$

$$b = -\lambda^2$$

$$b^2\,\text{var}(Y) = (-\lambda^2)^2\left(\frac{1}{\lambda^2}\right) = \lambda^2$$

$X_1, X_2, \ldots, \cancel{X_n}$ IID Poi(μ)

$$\bar{X}_n \approx \text{Normal}(\mu, \mu)$$

$$g(x) = \sin(x)$$

$$g'(x) = \cos(x)$$

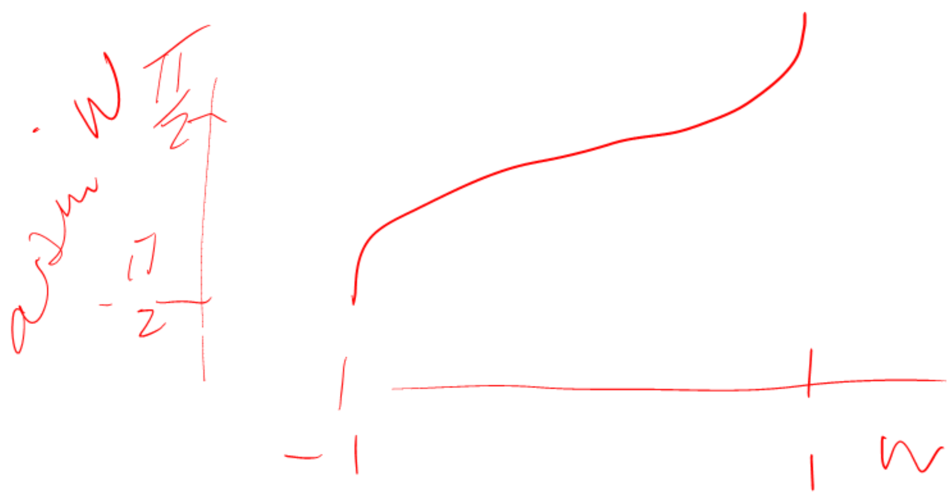
$$g(\bar{X}_n) = \sin(\bar{X}_n)$$

$$\approx \mathcal{N}\left(g(\mu), \frac{[g'(\mu)]^2 \sigma^2}{n}\right)$$

$$= \mathcal{N}\left(\sin(\mu), \frac{\cos^2(\mu) \cdot \mu}{n}\right)$$

μ may be function of other parameters


sin x
1
-1
-π/2
x
0
π/2


arcsin w
π/2
-π/2
-1
1
w

$$E(X) = \frac{1-p}{p} \qquad \text{var}(X) = \frac{1-p}{p^2}$$

$$\frac{1-p}{p} = \mu \qquad 1-p = p\mu \qquad 1 = p\mu + p$$

$$= p(1+\mu)$$

$$v(\mu) = \frac{1-p}{p^2} = \frac{1-\left(\frac{1}{1+\mu}\right)}{\left(\frac{1}{1+\mu}\right)^2} \qquad p = \frac{1}{1+\mu}$$

$$= (1+\mu)^2\left[1 - \frac{1}{1+\mu}\right] = (1+\mu)^2 - (1+\mu)$$

$$= (1+\mu)(1+\mu-1)$$

$$= \mu(1+\mu)$$

$$=$$