Shower S the probability of rejecting the when the is false! correctly IQ'S (again) Suppose you have a clue that IQ's in your population (uw under rands) are higher than average. Use d=.05 You start with a sample size of 9 and get $\overline{x} = 106$ n=9 $\overline{X}=106$ Ho: Mx=100 25.05 I tailed test Ha: Mx >100 $\sigma_{\chi} = \frac{\sigma_{\chi}}{\sqrt{n}} = \frac{15}{\sqrt{9}} = \frac{15}{3} = 5.$ $Z = \frac{X - M_{H_0}}{\sigma_{\pi}} = \frac{166 - 100}{5} = 1.2$ Zorit = 1.64 Zobs LZort. sour fail to reject Ho. 2des=1,2 area=.05 -2. . -1. . 0. . . . Zunt = 1.64 what if the two means of the population (UW undergrads) is 106? What is the probability of rejecting Ho? In other words what is the power of this test?

H6 distributions distribution aveas.05 green area = power = 0. 37 Ľ Ľ 2 Zunt = 144 The probality of Z=1.64 given Marce = 1.2 is the same as probability of 2>1.84-1.2 given u= 1.2-1.2=0 0.44 , area = 0.33 [.] د power 0 044 = 1,64-1.2 Z world Ho false to the faul to rejut Type II decision 1-.33=.67 Power reject Ho TypeI d' .33

Things that affect power 1) What if the true means, entrue = 112 (not 106) X-MHU effect stat! 0x $before: d = \frac{106 - 100}{15}$ n= 9 = 0.4 "med 2=.05 1 tailed $after: d = \frac{112 - 100}{15} = 0.8$ Zscure for 112 $2 = \frac{112 - 100}{5}$ = 2.4 $a_{rea} = 0.7749 \leftarrow P_r (z > 1.64 - 2.4)$ = Pr(Z>-0.76) area =0.05 z 1.64 A effect size A power

2) what if we increase in from 9 to 36? $L_{true} = 106$, d = .05 1 tailed $\overline{O_2} = \frac{15}{\sqrt{36}} = \frac{15}{6} = 2.5$ $E_{true} = \frac{106 - 100}{\sigma_{\chi}} = \frac{106 - 100}{2.5} = 2.4$ Power 15 0. 7749 area =0.7749 area =0.05 A sample size / power

3) what if we decrease & from , 05 to .01 (n=9, 11 = 106) Zcrut increases from 1.64 to 2.33 power went down from 0.33 to 0.13 area =0.13 area =0.01 -1 0 1 z -2 2 -3 3 2.33 / X