

AP Stats
Chap 19
Handout 1

Name _____ Pd _____

Show all necessary work and place your answers in/on the spaces provided.

IOC.

The International Olympic Committee (IOC) states that the female participation in the 2004 Summer Olympic Games was 42%, even with new sports such as weight lifting, hammer throw, and modern pentathlon being added to the Games. Broadcasting and clothing companies want to change their advertising and marketing strategies if the female participation increases at the next Games. An independent sports expert arranged for a random sample of pre-Olympic exhibitions. The sports expert reported that 202 of 454 athletes in the random sample were women. Is this strong evidence that the participation rate may increase?

1. Test an appropriate hypothesis and state your conclusion.
2. Was your test one-tail upper tail, one-tail lower tail, or two-tail? Explain why you chose that kind of test in this situation.

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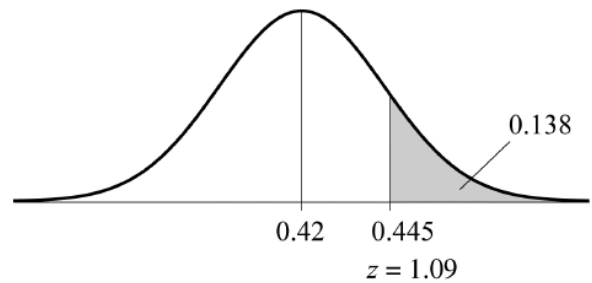
Hypotheses: $H_0 : p = 0.42$ $H_A : p > 0.42$

Model: Okay to use the Normal model because the sample is random, these 454 athletes are less than 10% of all athletes at exhibitions, and $np = (454)(0.42) = 190.68 \geq 10$ and $nq = (454)(0.58) = 263.32 \geq 10$. Use a $N(0.42, 0.023)$ model, do a 1-proportion z-test.

Mechanics: $n = 454, x = 202, \hat{p} = \frac{202}{454} = 0.445$

$$z = \frac{0.445 - 0.42}{\sqrt{\frac{(0.42)(.58)}{454}}} = 1.09$$

$$P = P(\hat{p} > 0.445) = P(z > 1.09) = 0.138$$



Conclusion: With a P -value (0.138) so large, I fail to reject the null hypothesis that the proportion of female athletes is 0.42. There is not enough evidence to suggest that the proportion of female athletes will increase.

2. Was your test one-tail upper tail, lower tail, or two-tail? Explain why you choose that kind of test in this situation.

One-tail, upper test. The companies will change strategies only if there is strong evidence of an increase in female participation rate from current rate of 42%.