Name : _____

Choose the correct hypothesis test for the following situations

1. To compare 2 dog training programs, an obedience school trained 43 dogs using Program A and 41 dogs using Program B. For Program A, the average number of training hours required was 24.8 with a standard deviation of 3.1 hours. For Program B, the mean was 22.9 hours with a standard deviation of 3.3 hours. Is there a significant difference between the two programs?

   Type of test _____

   H_o: H_a:

   Requirements

   Test statistic _____   P value _____   Reject/fail to reject _____

2. Five hundred adults participated in a comparison of the effectiveness of 3 arthritic pain relievers. Each participant used 1 of the 3 medications for 1 month and then was asked if the product was effective. The results were as follows:

   Pain Reliever

Effective	A	B	C
Yes	115	78	140
No	60	72	35

   Do the sample proportions differ significantly at the 1 percent level?

   Type of test _____

   H_o: H_a:

   Requirements

   Test statistic _____   P value _____   Reject/fail to reject _____

3. The manufacturer of a particular brand of microwave popcorn claims that only 2 percent of its kernels of corn fail to pop. A competitor, believing that the actual percentage is larger, tests 2,000 kernels and finds that 44 failed to pop. Do these results provide sufficient evidence to support the competitor's belief?

Type of test _____

H_o: H_a:

Requirements

Test statistic _____   P value _____   Reject/fail to reject _____

4. Dannon is supposed to put 29.6 grams of fruit in their fruit-flavored yogurt. To see if enough fruit is being placed in cups of fruit-flavored yogurt, a quality inspector measured the amount in 27 containers. She found an average of 28.9 grams of fruit and standard deviation of 2.8 grams. Does this show that there is probably enough yogurt in the cups?

Type of test _____

H_o: H_a:

Requirements

Test statistic _____   P value _____   Reject/fail to reject _____

5. A shoe manufacturer has developed a new running shoe that purportedly enables one to run faster. Eight adults participated in an experiment in which each ran a mile with regular track shoes and then ran a mile the next day with the new shoes. Their running times in seconds are below

runner	track shoe	new shoe
1	321	318
2	307	299
3	397	401
4	269	260
5	285	285
6	364	363
7	295	289
8	302	296

Is there evidence that the new shoe works better?

Type of test _____

H_o: H_a:

Requirements

Test statistic _____   P value _____   Reject/fail to reject _____

6. A leading auto manufacturer claimed that a popular version of its minivan was available in the Midwest for an average price or $16,000 with a standard deviation of $800. A consumer group doubted that report and surveyed 50 recent purchasers of the minivan to dispute the manufacturer's claim. They came up with an average of $16,277. Does this show that the manufacturer is making a false claim?

Type of test _____

H_o: H_a:

Requirements

Test statistic _____   P value _____   Reject/fail to reject _____

** assumes a .05 significance level

1. **Two sample t-test**
   H_0: $\mu_1 = \mu_2$
   H_A: $\mu_1 \neq \mu_2$

   where μ_1 = pop avg. number of training hours required for dog obedience Prog A
   and μ_2 =   "   "   "   "   "   "   "   "   Prog B

   test statistic: 2.72   p-value = .0081   fail to reject H_0

2. **Chi-square test for homogeneity**
   H_0: The proportion of adults for which the pain medication was effective was the same for each brand
   of pain reliever
   H_A: "   "   "   "   "   "   "   "   was different   "   "

   Test statistic: 28.56   p-value ≈ zero   reject H_0

3. **1-Proportion z test**
   H_0: $p = .02$
   H_A: $p > .02$
   Where p is the population proportion of kernels of a particular brand of microwave popcorn that fail to
   pop

   Test statistic: .64   p-value = .26   fail to reject H_0

4. **t-test for means**
   H_0: $\mu = 29.6$ g
   H_A: $\mu < 29.6$ g
   Where μ is the population average amount of fruit in Dannon's fruit-flavored yogurt

   Test statistic: -1.3   p-value = .1027   fail to reject H_0

5. **Matched pairs t-test**
   H_0: $\mu_D = 0$
   H_A: $\mu_D < 0$
   Where μ_D is the population average difference in running times for a mile for adults wearing track shoes
   and the new shoes (new shoe time – track shoe time)

   Test statistic: -2.31   p-value = .0271   reject H_0

6. **z-test for means**
   H_0: $\mu = \$16,000$
   H_A: $\mu \neq \$16,000$
   Where μ is the population average price of a minivan available in the Midwest from a leading auto
   manufacturer

   Test statistic: 2.45   p-value = .0144   reject H_0