AP Statistics Review—Choosing the Correct Inference Procedure

The table below lists the different inference procedures you should know for the AP Exam. In each of the scenarios that follow, choose the correct inference procedure by letter, and state the hypotheses where warranted.

S	One proportion z interval for P	One proportion z test for P	T
W	One sample t interval for μ, including paired data	One sample t test for μ, including paired data	I
E	Two proportion z interval for P_1-P_2	Two proportion z test for P_1-P_2	R
O	Two sample t interval for $\mu_1 - \mu_2$	Two sample t test for $\mu_1 - \mu_2$	C
J	t interval for the slope of a least-squares regression line	t test for the slope of a least-squares regression line	L
F	Chi-square test for goodness of fit	Chi-square test for homogeneity	H
P	Chi-square test for independence	None of these procedures apply	A

1. Which brand of AA batteries last longer – Duracell or Eveready?

C $H_0: \mu_D = \mu_E$
$H_a: \mu_D \neq \mu_E$

2. According to a recent survey, a typical teenager has 183 contacts stored in his/her cellphone. Is this true at Maclay School?

I $H_0: \mu = 183$ contacts
$H_a: \mu \neq 183$ contacts

3. What percent of students at Maclay School have a Twitter account?

S ( ) $\hat{P}$

4. Is there a relationship between the age of a student's car and the mileage reading on the odometer?

quant
L $H_0: \beta = 0$
$H_a: \beta \neq 0$

5. Is there a relationship between students' favorite academic subject and preferred type of music?

P H_0: Fav. sub and music type ind

6. Who is more likely to own an iPod – middle school girls or middle school boys?

E using $\hat{P}_G - \hat{P}_B$ to est diff in prop
(,) $P_G - P_B$

7. How long (in minutes per day) do teens typically spend brushing their teeth?

W ( )
use $\bar{x}$ → est μ = true mean minutes

8. Are the marshmallow pieces in Lucky Charms cereal equally distributed?

F H_0: marshmallow pieces equally distributed
H_a: " " NOT equally dist.

9. Which brand of razor gives a closer shave? To answer this question, researchers recruited 25 men to shave one side of their face with Razor A and the other side with Razor B. The whiskers, without shave cream, from each side of the face will be weighed.

$D = A - B$ OR $B - A$
Paired t-test
I $H_0: \mu_D = 0$
$H_a: \mu_D \neq 0$

10. Is exercise and drug treatment more effective than drug treatment alone at reducing the incidence of heart attacks among men aged 65 and older?

E ( ) $\hat{P}_{ED} - \hat{P}_D$

11. How much more effective is exercise and drug treatment than drug treatment alone at reducing the incidence of heart attacks among men aged 65 and older?

R $H_0: P_{E+D} = P_D$
$H_a: P_{ED} < P_D$

12. Estimate the difference in mean grip strength for patients who underwent carpal tunnel surgery using endoscopy and patients who underwent open-incision surgery.

O ( )
use $\bar{x}_E - \bar{x}_S$ to estimate $\mu_E - \mu_S$

13. A large city's DMV claims that 78% of candidates pass their driving test on the first try. A local newspaper reported that only 61 of 90 randomly selected teens passed on the first try. Does this suggest that the teens have a lower pass rate than the DMV's claim?

T Ho: $p = .78$
Ha: $p < .78$

14. Many high schools survey graduating classes to determine the plans of the graduates. We are interested to see if the plans of students in high schools from 5 different regions of the US are the same.

H Ho: dist of grad. plans same for 5 regions
Ha: " " " differ

15. From high school students who have posted online profiles, how much more likely are girls than boys, on average, to have others view their profile.

D (,)
using $\bar{x}_G - \bar{x}_B$ to est. diff in means $\mu_G - \mu_B$

16. Researchers in Food Science studied how big people's mouths tend to be. They measured mouth volume by pouring water into the mouths of subjects who lay on their backs. (Could there be another way?) It turns out that mouth volume is related to height. Estimate how mouth volume of 90 randomly selected individuals increases as their height increases.

(,)
J using sample slope b to est population slope β

Place the letter for each problem on the blanks.

I	F	P	I	S	L	O	W	R	E	J	E	C	T	H	O
2	8	5	9	3	4	15	7	11	6	16	10	1	13	14	12