NAME: _____

Math P.A.T. Prep
Probability in Society - SOLUTIONS

KEEP CALM AND DO THE MATH
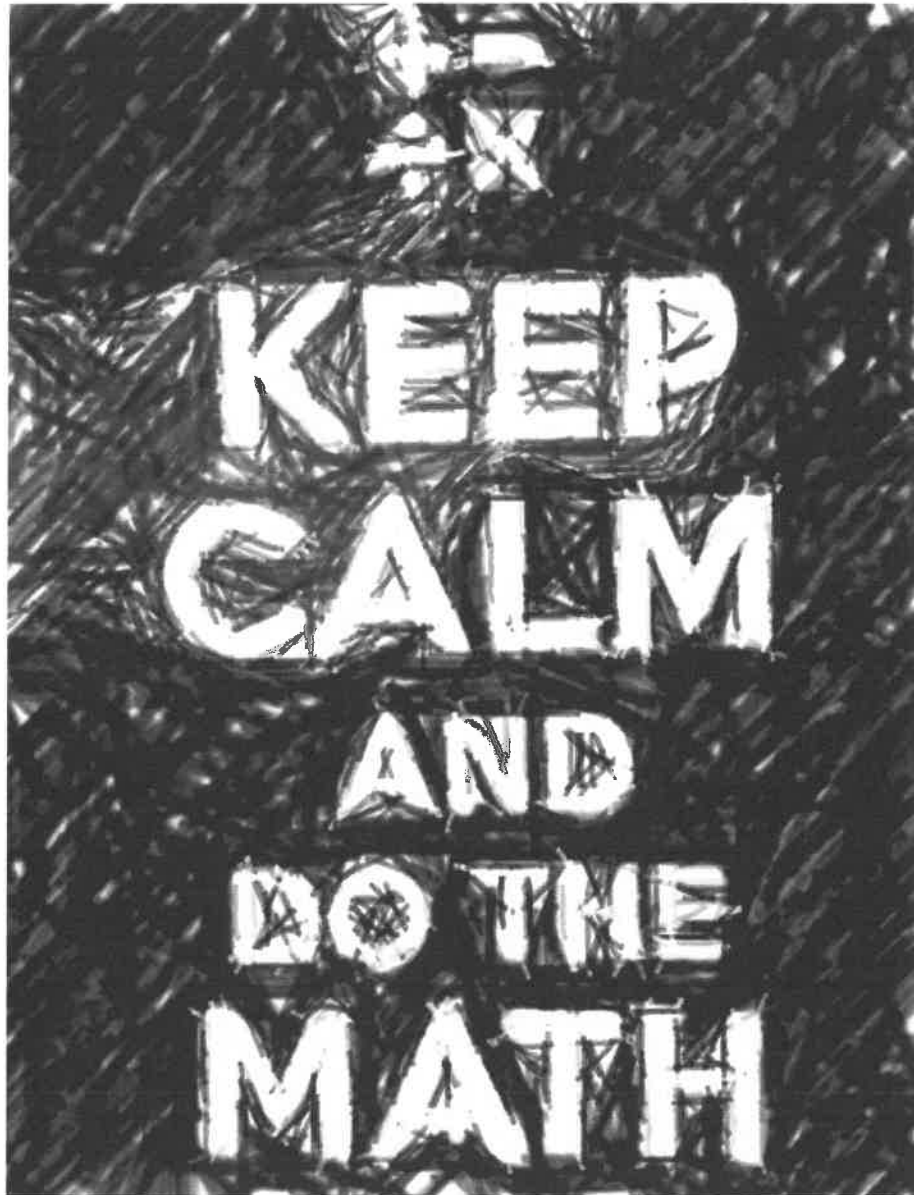
St. Brendan School
Mr. Martinez

PROBABILITY IN SOCIETY

A school principal asks every student and staff member in the school if they like the idea of school uniforms. The school has 450 students and 30 staff members.

7. The survey above uses a _____i_____ , and _____ii_____ would have the most influence on the data.

The statement above is completed by the information in row

Row	i	ii
A.	sample	students
B.	sample	staff
C.	population	students
D.	population	staff

- Since he used everybody, he used the population.

• Since there are many more students that staff, Students will have the most influence on the data

The following survey question was given to a sample of Grade 9 students:

Do you prefer to use your television to play childish video games or to watch educational programs?

26. Data collected by this survey may be **most** influenced by a problem related to

A. ethics
B. privacy
C. use of language
D. cultural sensitivity

the interviewer says "childish video games", which probably means he does not enjoy playing them.

A teacher placed a cafeteria coupon in only one of three differently coloured envelopes. A randomly selected student was asked to choose one of the three envelopes. The student chose the red envelope because red was his favourite colour.

7. The student's decision was based on

A. subjective judgment
B. theoretical probability
C. experimental probability
D. mathematical calculation

any decision made based on feelings, likes, superstition, etc. is made by subjective judgment.

14. Which of the following statements is **not** a valid reason for using a representative sample to conduct a survey?

A. It is cheaper to use a sample. This is ok
B. There is too much error in a sample not true
C. There is too much data in the complete population. True?
D. It is too time-consuming to use the complete population

Nina and Sarah observe that 6 of their 10 female classmates are shorter than 160 cm. Nina concludes that of the 410 students in their school, 246 are shorter than 160 cm. Sarah believes Nina's conclusion cannot be supported by her observation.

12. Which of the following statements **best** supports Sarah's belief?

6 of 10 females → > 160 cm

410 students

    A. Nina's survey sample contains only female students.

↳ 41 groups → 6 are > 160

    B. Nina's probability calculation is incorrect. *→ it is correct*

                                                      ↓

    C. Nina did not use a proper questionnaire. *246*

    D. Nina completed her survey too quickly.

Ethan conducts a survey to determine the demand for an outdoor skating rink in his community.

40. Ethan can **best** minimize the bias in his survey by collecting data from people who

    A. are different ages *more diverse population*

    B. live in different cities

    C. participate in figure skating

    D. visit the rink at the same time each day

Consider the following four surveys.

    1 Customers in an electronics store are asked whether they would purchase last year's model of a television or wait for this year's new and improved model.

    2 A random sample of Grade 9 boys is asked to determine which snacks should be available in the school's vending machine.

    3 During the summer, every household in a large community is asked to complete a detailed questionnaire to help determine whether the local skating rink should be renovated.

    4 Grade 6 students are asked how many times they wash their hair each week.

Numerical Response

8. Match each survey listed above with the potential data collection problem it **best** represents.

Survey:	2	1	4	3
Data collection problem:	**Bias**	**Use of Language**	**Privacy**	**Time and Timing**

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

The chart below shows the life expectancies, at birth, of males and females in a particular country over 40 years.

Year of Birth	Life Expectancy at Birth (years)	
	Male	Female
1970	67.1	74.1
1980	70.0	76.5
1990	71.8	78.5
2000	74.3	79.6
2010	75.2	80.4

0. Which of the following assumptions supports the prediction that a female born in the year 2020 in this country will live to the age of 80.7 years?

A. Females in this country live longer than males. ~~True~~ not sure (life expectancy is at birth)

B. The life expectancy for females will continue to slowly increase. → it has !

C. Changes in the environment will reduce life expectancies by 2020. Don't know this

D. The gap between the life expectancies of males and females will be smaller in 2020. Not sure

Jonas conducts a survey to determine which flavour of ice cream is the favourite among the students at his school. He plans to hand out the questionnaire shown below to 100 randomly selected students.

Which of the following ice cream flavours is the best?

☐ Strawberry

☐ Chocolate

☐ Vanilla

36. The analysis of the data collected by this survey would be **most** affected by issues related to

A. privacy — not an issue

B. use of language — does not give students much room to talk about other flavour

C. time and timing → it takes time, but it's short.

D. cultural sensitivity — we are not sure this is an issue

The organizer of a 16-team soccer tournament wants to conduct a survey to determine the minimum number of games each team in the tournament would like to play.

21. Which of the following samples would provide the most reliable results for her survey?

A. One player each from half of the teams

B. Every fourth team that registers in the tournament

C. Three randomly selected players or coaches from each team → everybody has a voice

D. All of the players and coaches from one randomly selected team

A manager selected 25 watches to test from a batch of 750 watches. He determined that 3 of the selected watches were defective. Based on the results of his survey, the manager concluded that 12% of the 750 watches were defective.

10. Which of the following assumptions did the manager use to reach his conclusion?

A. The process for testing the watches was unreliable.

B. The parts used in the watches are rarely defective.

C. The sample was representative of the population. → he assumed (wrongly, but still!)

D. The watches were made by the same employee