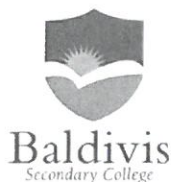


Name:

Solutions

Date: _____

Class: _____

**Year 12 Essential Mathematics****Investigation 2, 2018****Topic – Probability**

/ 31

%

Total Time: One Lesson**Weighting:** 8%**Equipment:** One die each

Are there really hungry people in Australia?

Yes, there are. Hunger is a hidden crisis in Australia, with over 3.6 million people experiencing food insecurity at some point every year, 27% of which are children. In fact, the demand for food relief is rising, with charities reporting a 10% increase in demand last year.

It is also a common misconception that only homeless people require food relief. However, the main recipients of food relief are individuals and families who have generally low incomes or are unemployed, not just those who are homeless. The face of hunger in Australia is diverse – it affects males, females, children, the elderly, single people and families, students, employed, unemployed and retired people. High risk groups include people with disabilities, refugees and Indigenous Australians.

The facts on hunger in Australia:

3.6 million people report having experienced food insecurity in the last year

652,000 people receive food relief from Foodbank agencies, every month

27% of those are children

65,000 people are turned away every month because of food shortages

Question 1**[2 marks]**

How many children receive food relief from Food bank agencies last month (round to the nearest hundred)?

$$652,000 \times \frac{27}{100} = 176,040 \checkmark$$

$$= 176,000 \checkmark \checkmark$$

The school wants to run a lunch program for students who are hungry and are at risk. Rather than survey students they decide to run a simulation.

Knowing the expected probability is one in 6 (1 in 6) state wide, create a simulation using a die, to find out how many students in a class of 32 would require a meal at lunch.

Question 2

[2 marks]

Why would running a simulation be better than asking students?

(mark per reasonable answer)

- Faster and easier than survey
- cheaper, no resources needed
- less embarrassment for hungry students

Question 3

[1 marks]

How many children would you expect to be hungry?

~ 5 students.

Question 4

[4 marks]

Outline how you would run your simulation for 4 classes of 32 students.

- ° allocate a number on die for hungry student ✓
- ° roll die 32 times per class (x 4) ✓
- ° record results ✓
- ° repeat activity for accuracy ✓



Question 5

[10 marks]

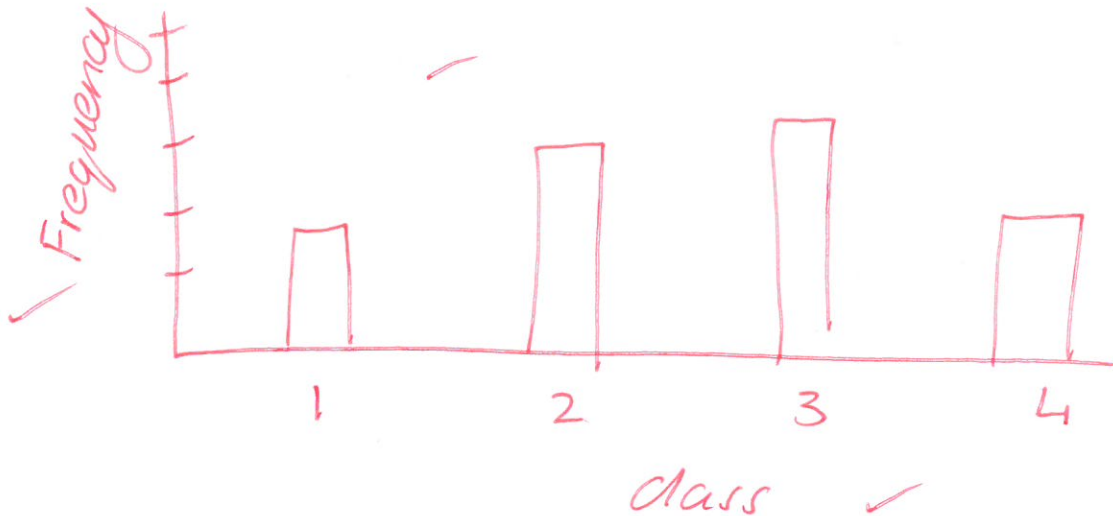
Run your simulation for 4 classes of 32 students.

- Record, display/graph and summarise your data.
- Extra space on the last page if needed.

→ Tally + correct total for each class (4 marks)

→ Neat + systematic way of recording results

Title ✓



(4 marks for graph)

$\frac{10}{32}$ $\frac{5}{32}$ $\frac{23}{32}$ $\frac{15}{32}$ examples.

Question 6

3
[4 marks]

Once you have run the simulation describe the results you have collected using statistical terms.

If you run the simulation again, will you get the same results. Why/Why not. give two reasons.

→ no you will not get the same result ✓

- your ~~the~~ simulation will not ~~get~~ yield the same result because its random ✓

- ✓

Question 7

[3 marks]

If the school wished to provide the same number of meals to each class, how many should they provide?

Max number ~~so no one misses out.~~ ✓

Explain your reasoning.

- no one misses out

- have meals to spare

(any two reasonable answers)

Question 8

[3 marks]

Your simulation was for 128 students. Statistically 23 should have been hungry and need a meal.

How did your results compare to that number? Why do you think this is?

- depends on results ✓

- $\frac{23}{128}$ is the theoretical probability. The simulation is experimental so it won't be exactly the same.

Question 9**[2 marks]**

How could you improve your simulation for next time?

- run more simulations per class and use the average.
- use a better/more accurate way of running the simulation ie: computer.

Extra Space for Question 5

