11.3 Probability in Society

Thursday, May 24, 2018 9:10 AM

A. Measures of Central Tendency

Mean – (average) found by finding the sum of numbers in a set and dividing by how many numbers are in the set.

ex Find the mean of 6, 8, 5, 9, 12:

$$\frac{(6+8+5+9+12)}{5} = \frac{40}{5} = 8$$

Median – the data point in the middle after the values have been arranged in order.

ex Find the median of 8, 2, 6, 9, 5

~~2~~, ~~5~~, 6, ~~8~~, ~~9~~ (median)

~~5~~, ~~6~~, 8, ~~9~~, ~~12~~ (median)

Mode – the most frequently occuring number in a set. There can be more than one mode.

ex Find the mode(s) of 2, 2, 4, 6, 6, 8, 11

2 and 6

B. Probability

– the likelihood of an event occurring.
– can be expressed as a fraction, ratio or % ($\frac{a}{b}$, $a:b$)

Experimental probability – the likelihood of an event happening based on experiment results.

Theoretical probability – the expected outcome; the

Theoretical probability – the expected outcome; the ratio of the # of favourable outcomes to the total number possible

$$P = \frac{\text{favourable outcomes}}{\text{total \# of outcomes}}$$

ex Theoretical probability of rolling a 3?

$$\frac{1}{6}$$

- With more trials (rolls of dice) the experimental probability will get closer to the theoretical probability

- be careful not to make broad generalizations based on a small (possibly inaccurate / biased) sample.

Ex Using a Sample to make a prediction

All grade 9 students in 5 high schools recorded their eye colour. 2300 students surveyed:

Eye colour	#
Brown	1656
Blue	483
Green	115
Other	46

A. Use the results to predict how many of the 7200 college students have brown eyes.

$$\frac{1656}{2300} = \frac{X}{7200}$$ same area

$$X = \frac{7200(1656)}{2300} = 5184$$ college st have brown

B. Predict how many students in class have blue eyes: 21 student today

$$\frac{483}{\quad} = \frac{B}{\quad}$$ $B = 4.41 \rightarrow 4$ people ← theoretical

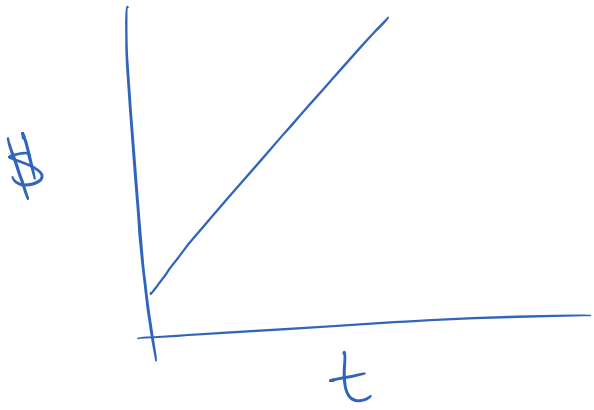
$$\frac{483}{2300} = \frac{B}{21}$$

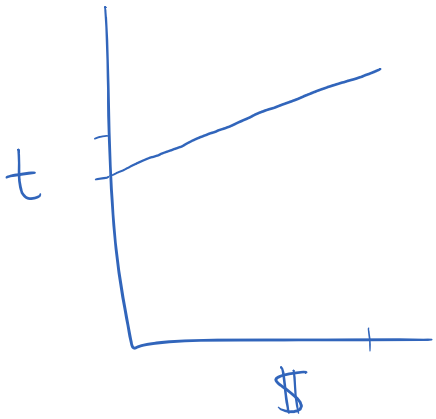
$B = 4.41 \rightarrow 4$ people ← theoretical

experimental → 3 people in class actually have blue eyes

Be careful: Watch for misconceptions, etc

ex cost of gas





pg 435 # 4, 5, 9, 10, 11