Math Virtual Learning

Algebra IIB
The Data Unit - Probability

May 22, 2020

Algebra IIB
Lesson: May 22, 2020

Objective/Learning Target:

Quick Review over Probability and Statistics

Let's Get Started!

1. The graphs we studied are Circle, Stem and Leaf, Histogram, or Box and Whiskers
   a. Which one are you the best at?
   b. Which one do you feel you need to get better at?
2. What does standard deviation measure? Center or Spread?
3. In order to use the Empirical Rule, your data must be _____?
4. Why do we need to use Z-Scores?
5. What does it mean when they say a 95% Confidence Interval?
6. What is the difference between Probability vs Odds?
7. Instead of drawing a Tree Diagram you could use what Principle?
8. How do you know when a probability is Independent?
9. What is the difference between a Union and an Intersection Probability?
10. What is the difference between Combinations and Permutations?

1. Your opinion, answers vary
2. Spread
3. In order to use the Empirical Rule, your data must be _NORMAL_?
4. Why do we need to use Z-Scores? To find the % of your data above, below, or between your data points.
5. What does it mean when they say a 95% Confidence Interval? You are 95% confident that the "true mean" is somewhere between your intervals.
6. What is the difference between Probability vs Odds? P = what you want/total, O= what you want/what you don't want
7. Instead of drawing a Tree Diagram you could use what Principle? Fundament Counting Principle
8. How do you know when a probability is Independent? When the first event doesn't affect the 2nd event's outcome.
9. What is the difference between a Union and an Intersection Probability? Union= P(A ∪ B)=add, Intersection=P(A∩) = multiply
10. What is the difference between Combinations and Permutations? Combination=order doesn't matter, Permutation=order matters

One last Mega-Practice problem

Part 1: Make a chart showing all of the possible sums of rolling two dice.

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

One last Mega-Practice problem

Part 1 ANSWER: Make a chart showing all of the possible sums of rolling two dice.

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

One last Mega-Practice problem

Part 2: Find the given probabilities

- Probability of rolling a sum of 2 or 12
- Probability of rolling a 4 on the first die and a 2 on the second
- Probability of rolling a sum greater than 8
- Probability of rolling a 4 on the first die or a 2 on the second die

	1	2	3	4	5	6
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2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
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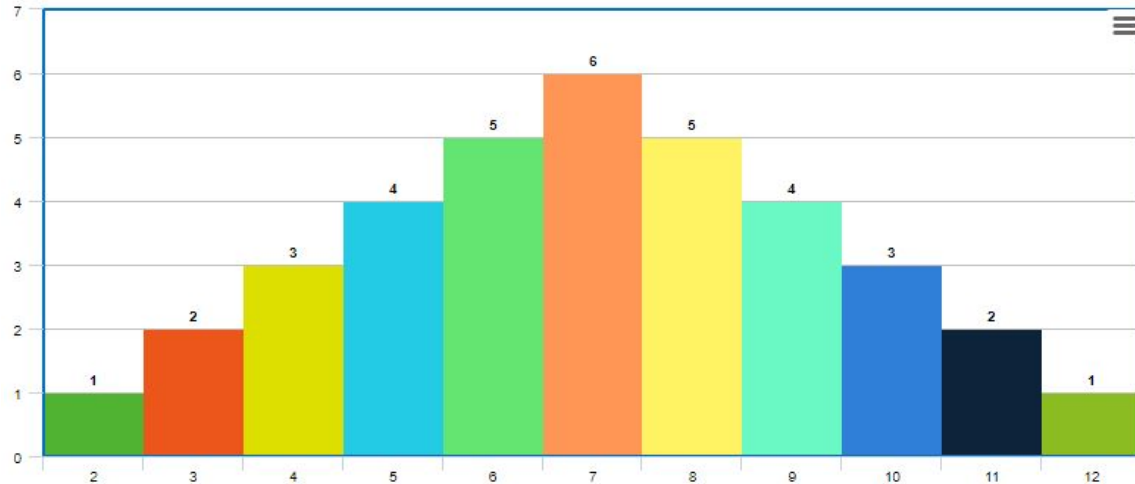# One last Mega-Practice problem

Part 2 ANSWER: Find the given probabilities

- Probability of rolling a sum of 2 or 12
  2/36 = 1/18
- Probability of rolling a 4 on the first die **and** a 2 on the second
  ⅙*⅙=1/36
- Probability of rolling a sum greater than 8
  P(9) = 4/36 P(10) = 3/36 P(11) = 2/36 P(12) = 1/36
  4/36+3/36+2/36+1/36 = 10/36 = 5/18
- Probability of rolling a 4 on the first die **or** a 2 on the second die
  ⅙ + ⅙ = 2/6 = ⅓

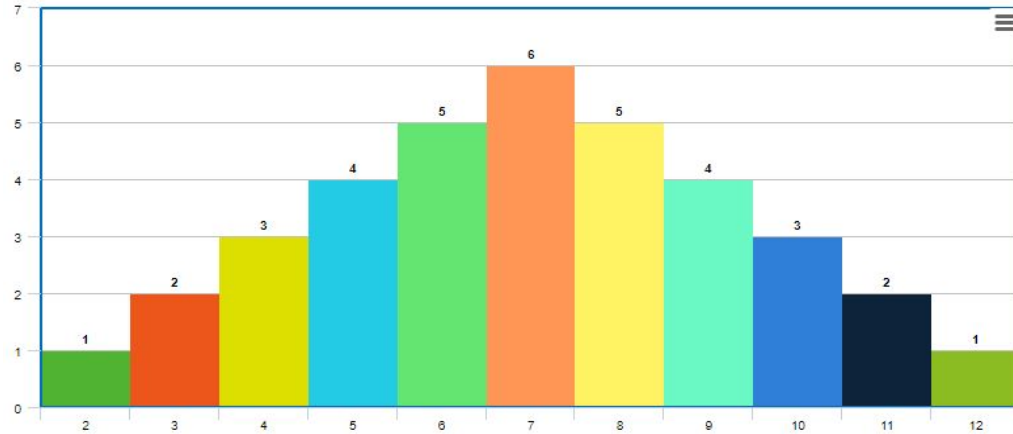|	1	2	3	4	5	6
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6	7	8	9	10	11	12

One last Mega-Practice problem

Part 3: Above a graph of the results of the sums possible from rolling two dice.

- What type of graph is drawn?
- What is the mean, median and mode?
- What is the standard deviation?
- Is the curve normal?

One last Mega-Practice problem

Part 3 ANSWER: Above a graph of the results of the sums possible from rolling two dice.

- What type of graph is drawn? HISTOGRAM
- What is the mean, median and mode? They are all 7
- What is the standard deviation? 2.45
- Is the data normal? NO! It looks normal, but if you calculate it, only 67% of the data is in the range and we need 68%. So it was close, but no!

One last Mega-Practice problem

Part 4: Our data was not normal. But let's assume we have a set of data that is normal with a mean of 7 and a standard deviation of 2.45.

What is the z-score for rolling an 11?

What percentage of the data falls between 5 & 9?

One last Mega-Practice problem

Part 4 Answer: Our data was not normal. But let's assume we have a set of data that is normal with a mean of 7 and a standard deviation of 2.45.

What is the z-score for rolling an 11?

11-7 = 4   4/2.45 = 1.63   z-score = 2.45

What percentage of the data falls between 5 & 9?

z-score of 9 = 0.82 = 79.39%   z-score of 5 = -0.82 = 20.61%
Percentage of data between 5-9 = 58.78%