Bag A or Bag B?

Brenda Gunderson

Bag A or Bag B?

BAG A

Face Value	Frequency
- 1,000	1
10	7
20	6
30	2
40	2
50	1
60	1

BAG B

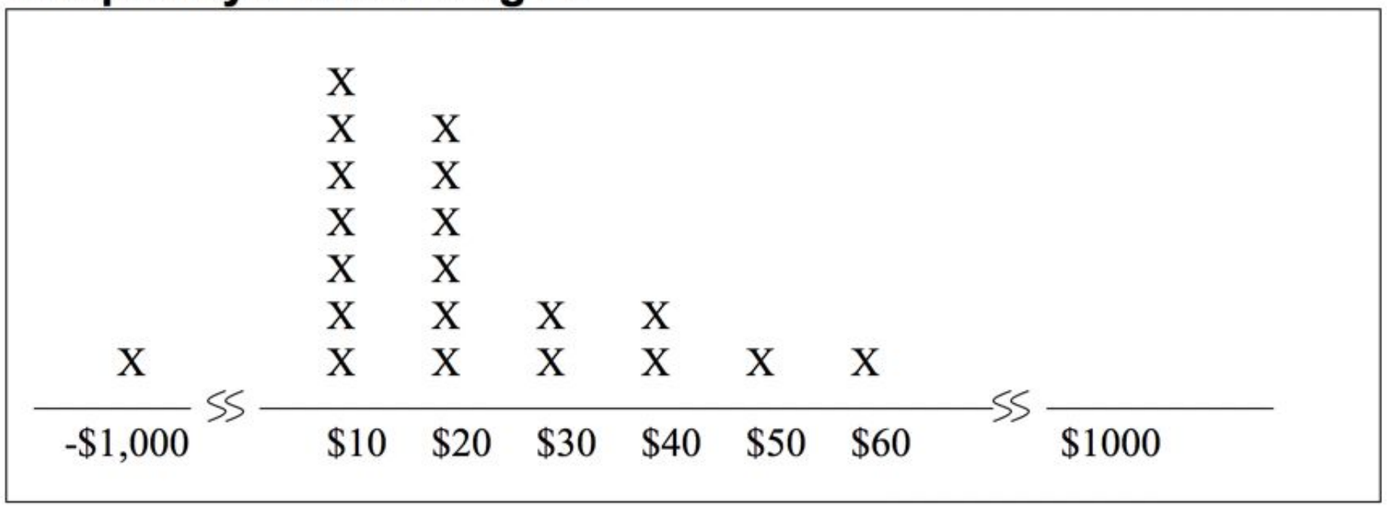
Face Value	Frequency
10	1
20	1
30	2
40	2
50	6
60	7
1,000	1

Total Value: -$560

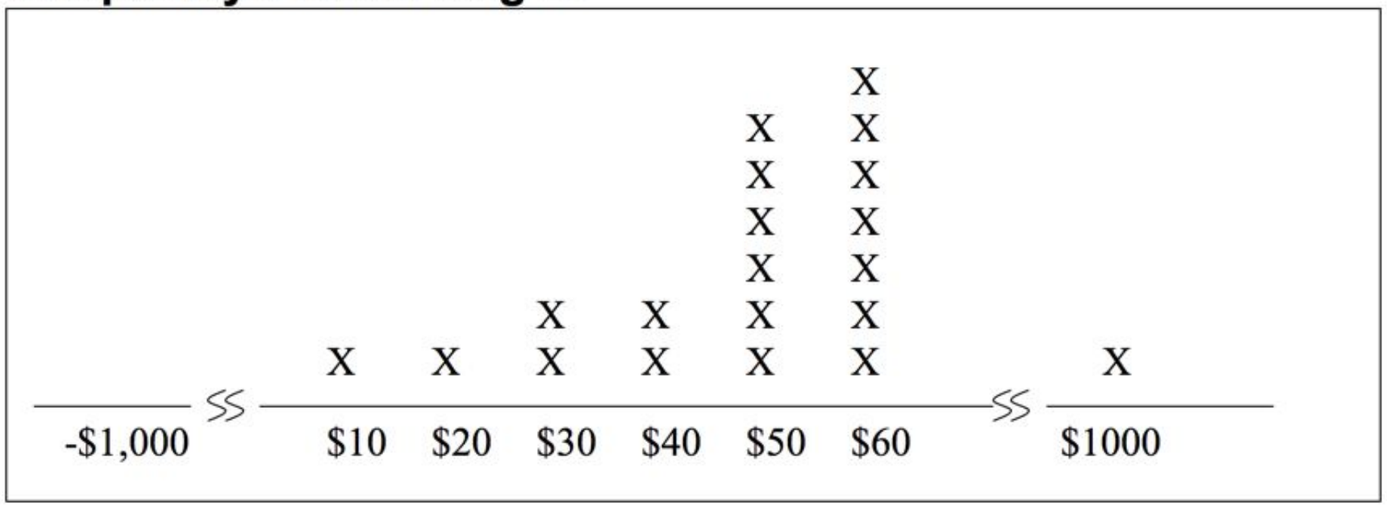
Total Value: -$1890

Segment Title Here!
2 Line Segment Title

Frequency Plot for Bag A:



Frequency Plot for Bag B:

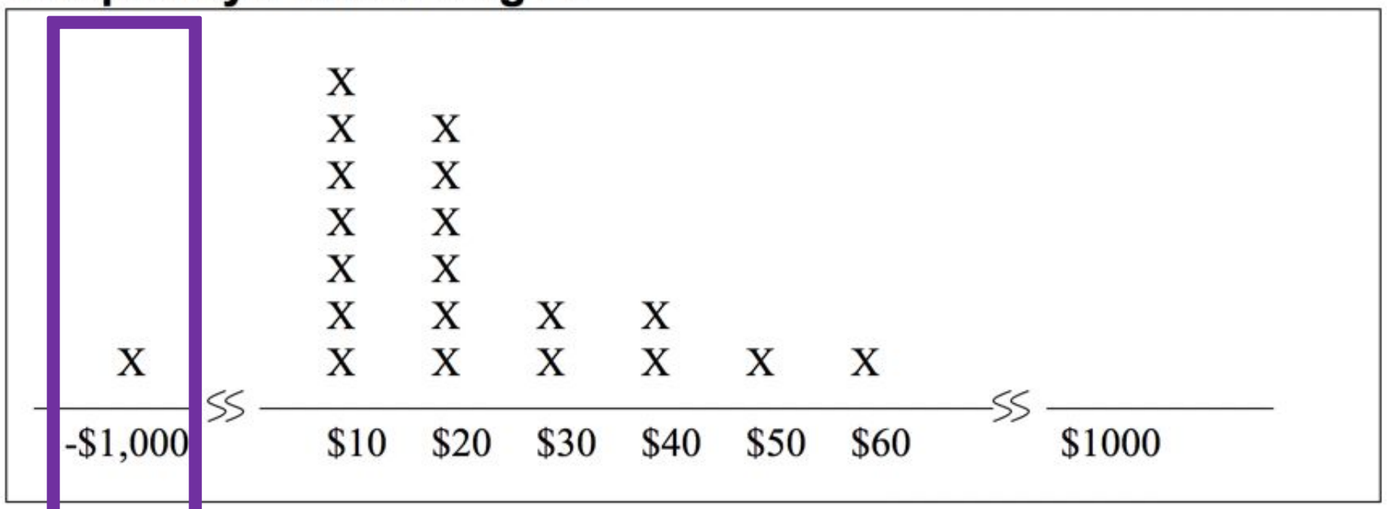


Select one voucher at random from shown bag and decide between two competing theories

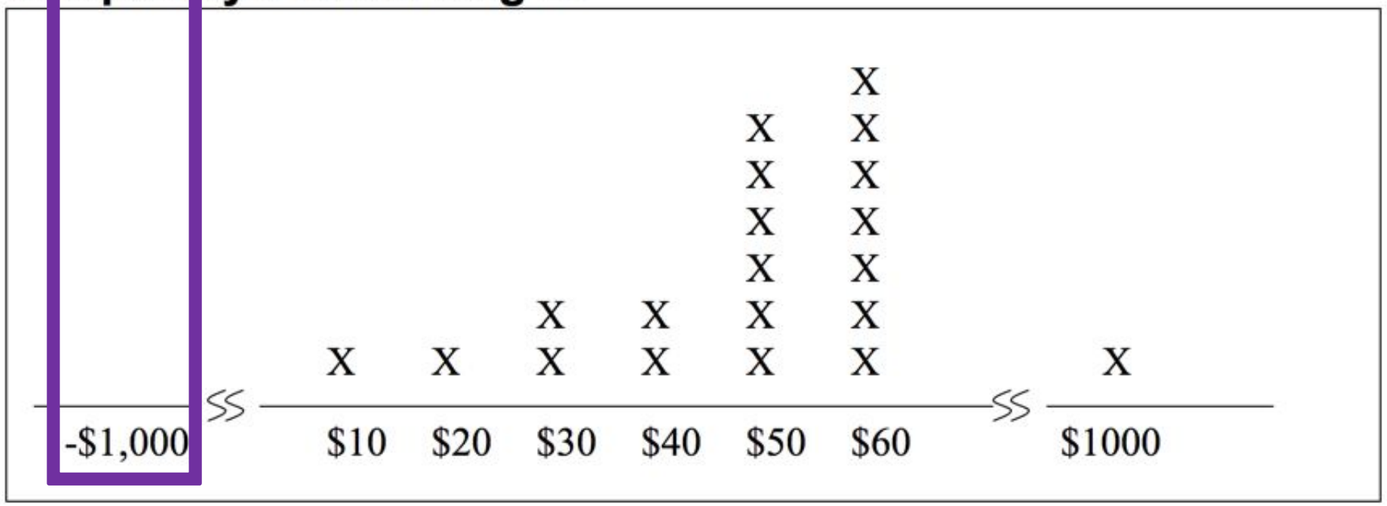
Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Frequency Plot for Bag A:



Frequency Plot for Bag B:

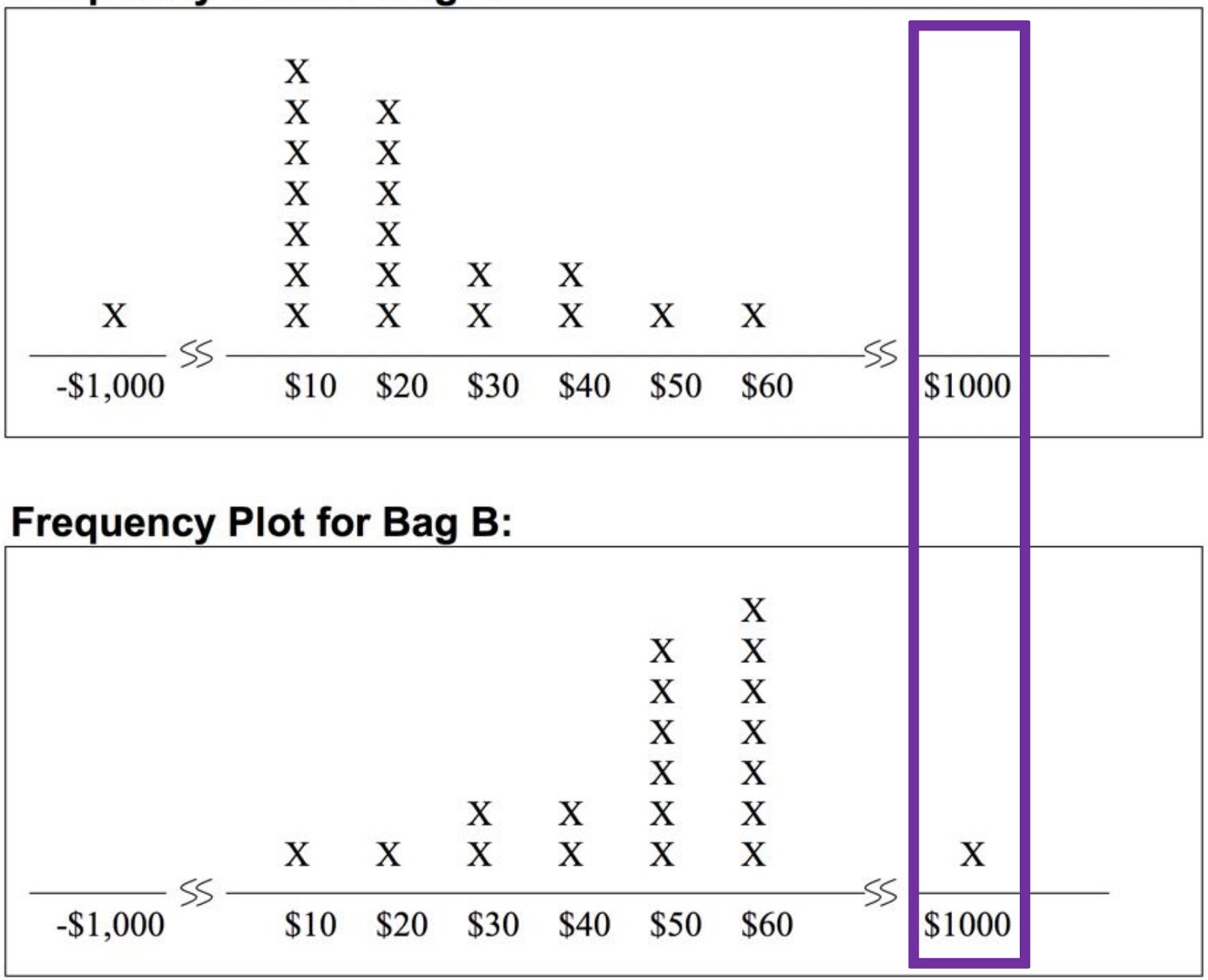


Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

What if select -$1000?

Frequency Plot for Bag A:



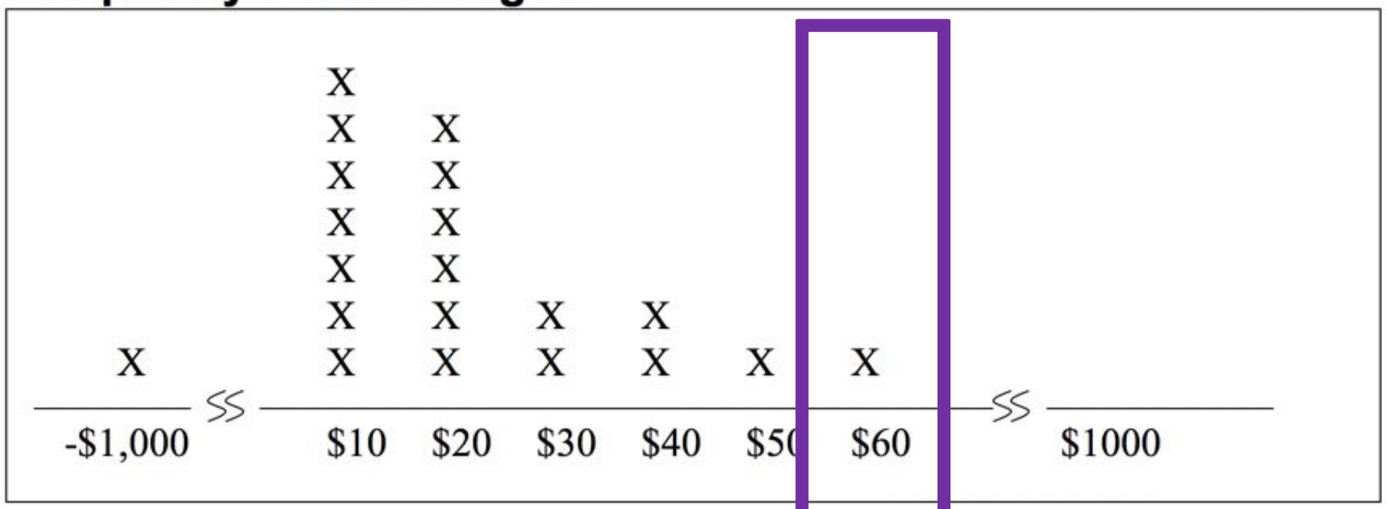
Frequency Plot for Bag B:

Null:
Shown bag is **Bag A**

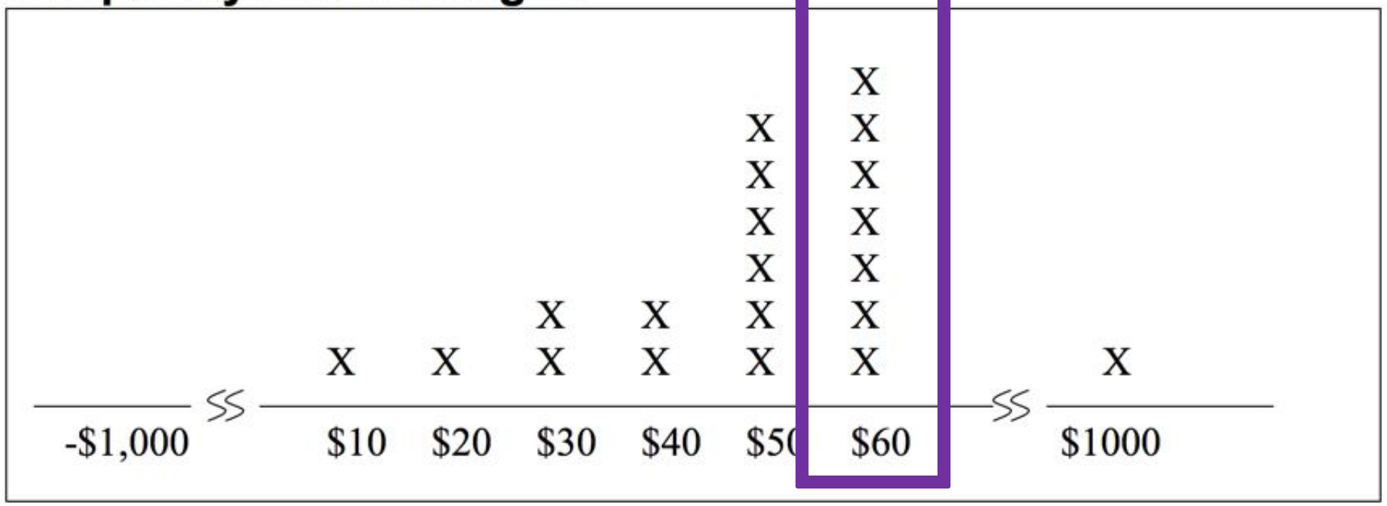
Alternative:
Shown bag is **Bag B**

What if select $1000?

Frequency Plot for Bag A:



Frequency Plot for Bag B:

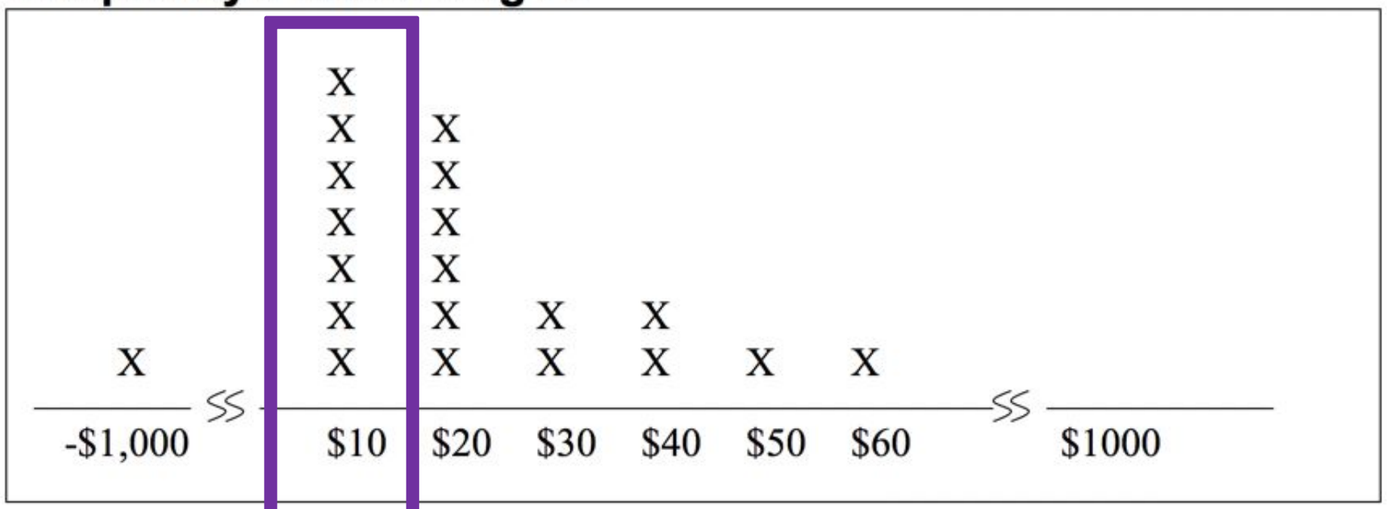


Null:
Shown bag is **Bag A**

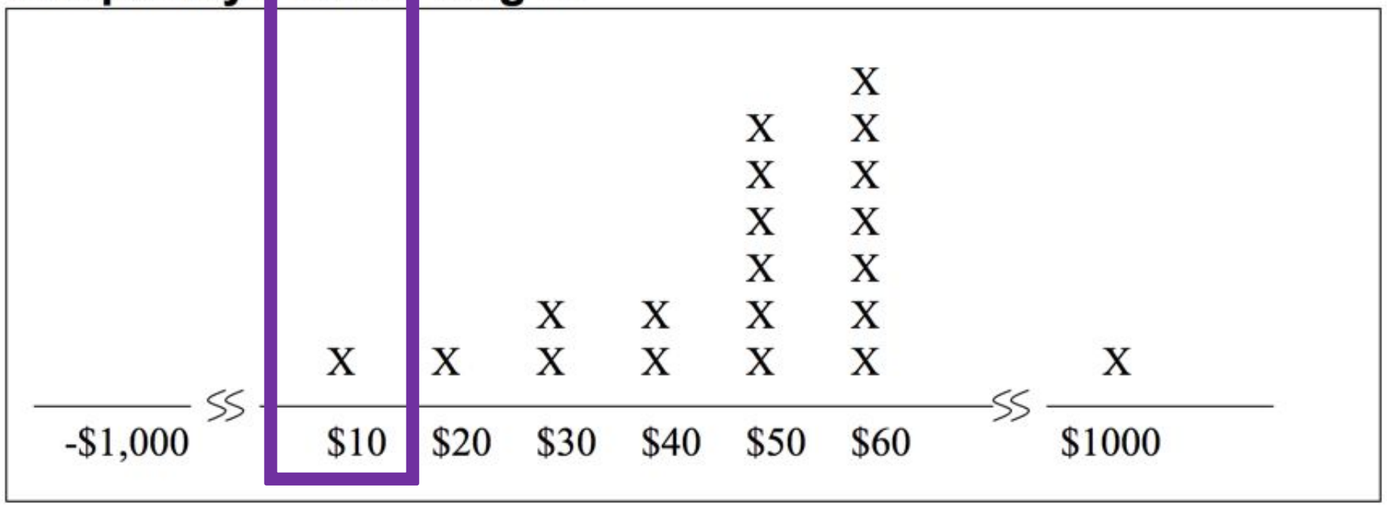
Alternative:
Shown bag is **Bag B**

What if select $60?

Frequency Plot for Bag A:



Frequency Plot for Bag B:



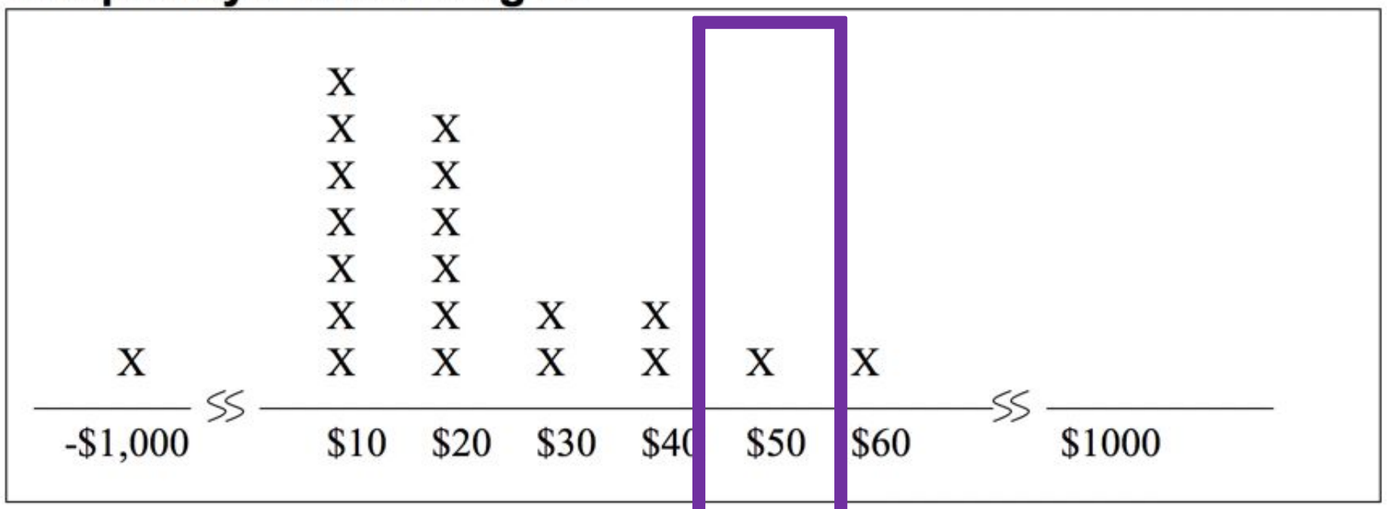
Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

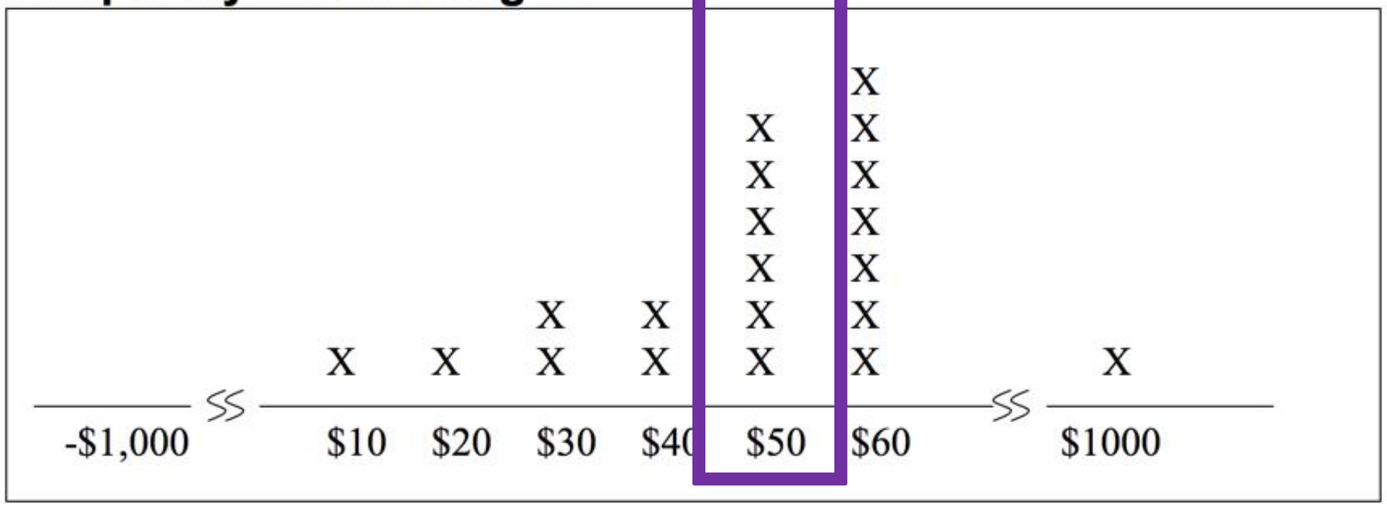
What if select $10?

Starting for form a **decision rule**

Frequency Plot for Bag A:



Frequency Plot for Bag B:

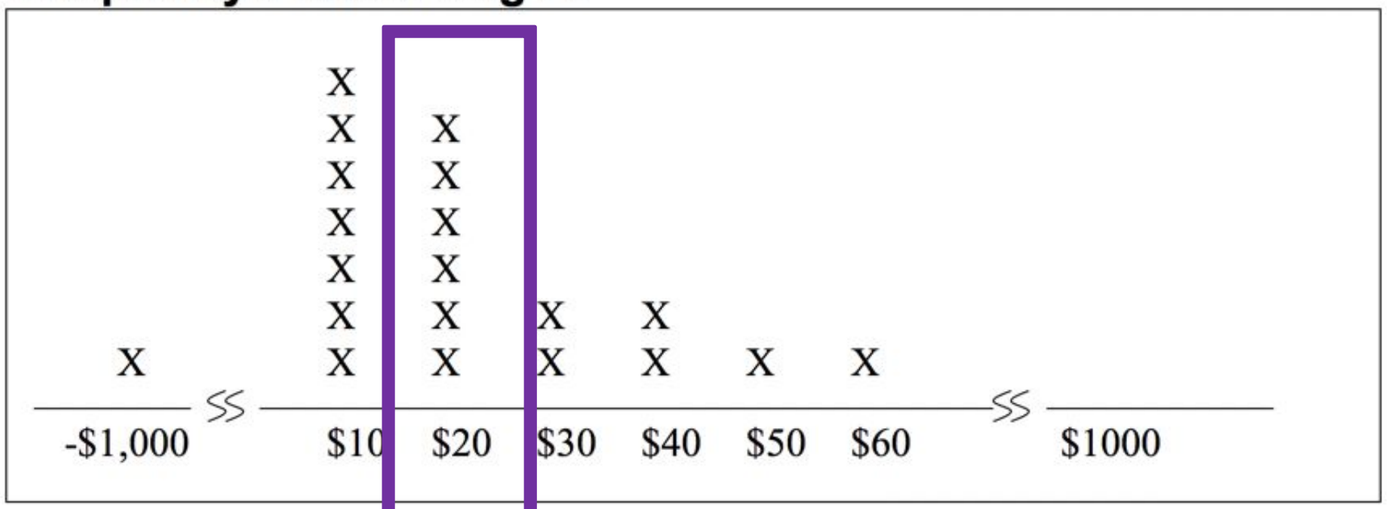


Null:
Shown bag is **Bag A**

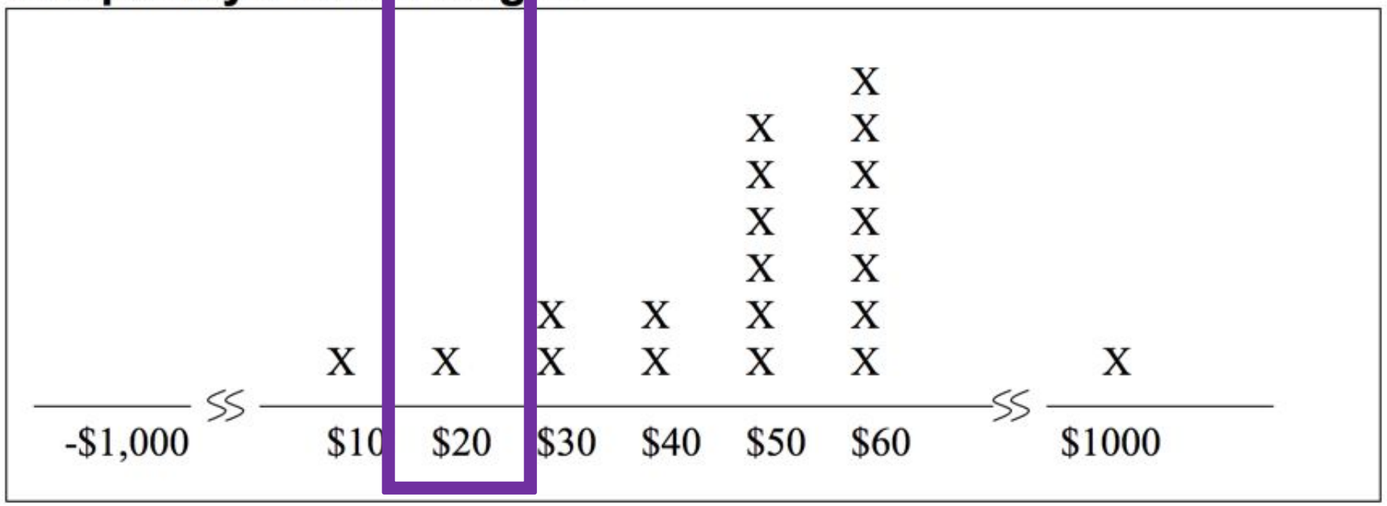
Alternative:
Shown bag is **Bag B**

What if select $50?

Frequency Plot for Bag A:



Frequency Plot for Bag B:

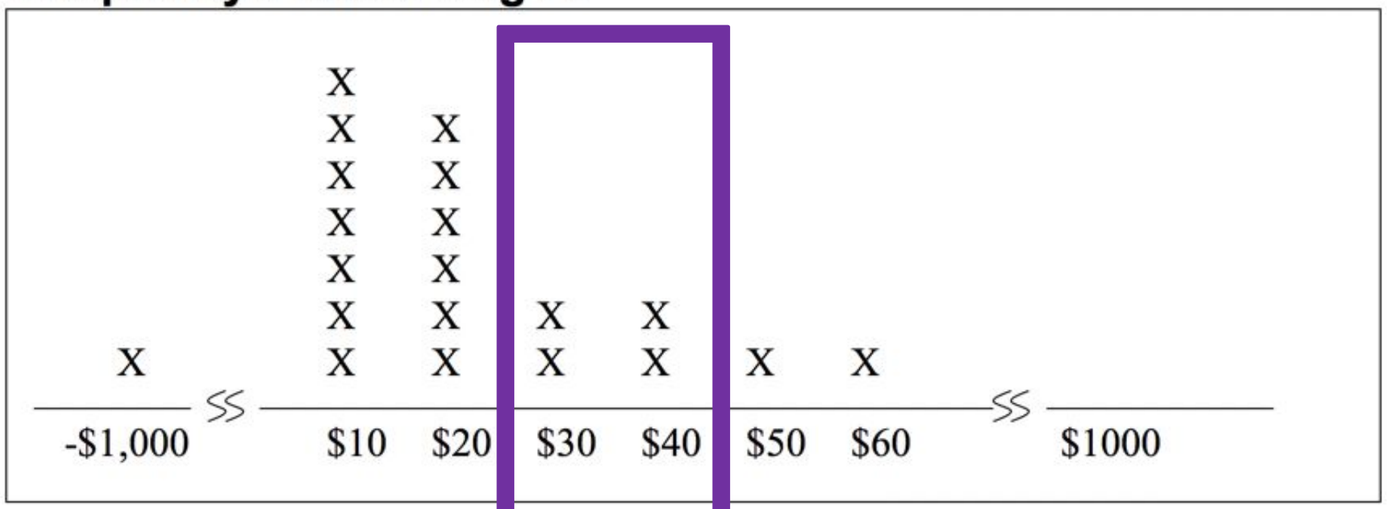


Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

What if select $20?

Frequency Plot for Bag A:

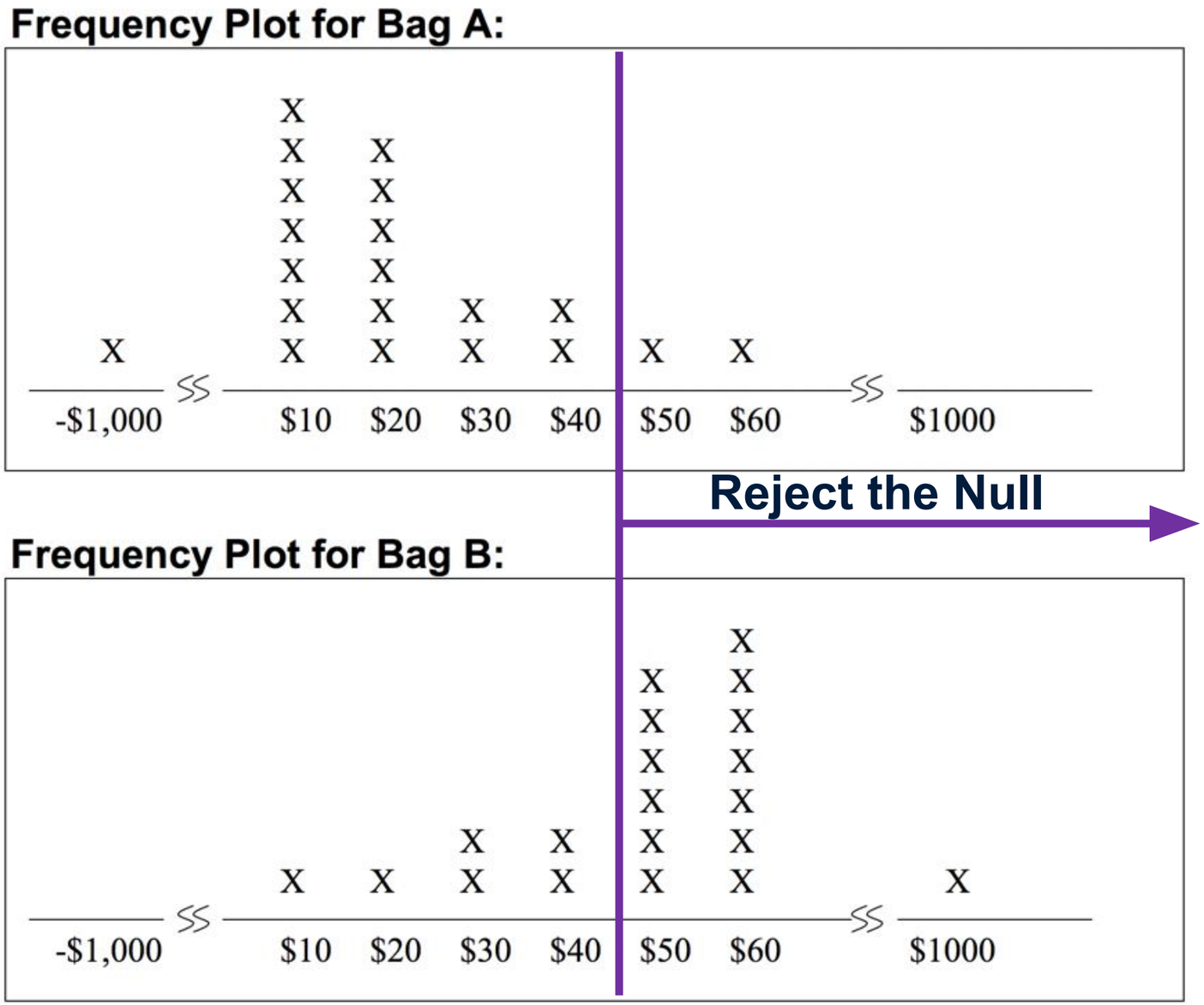


Frequency Plot for Bag B:

Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

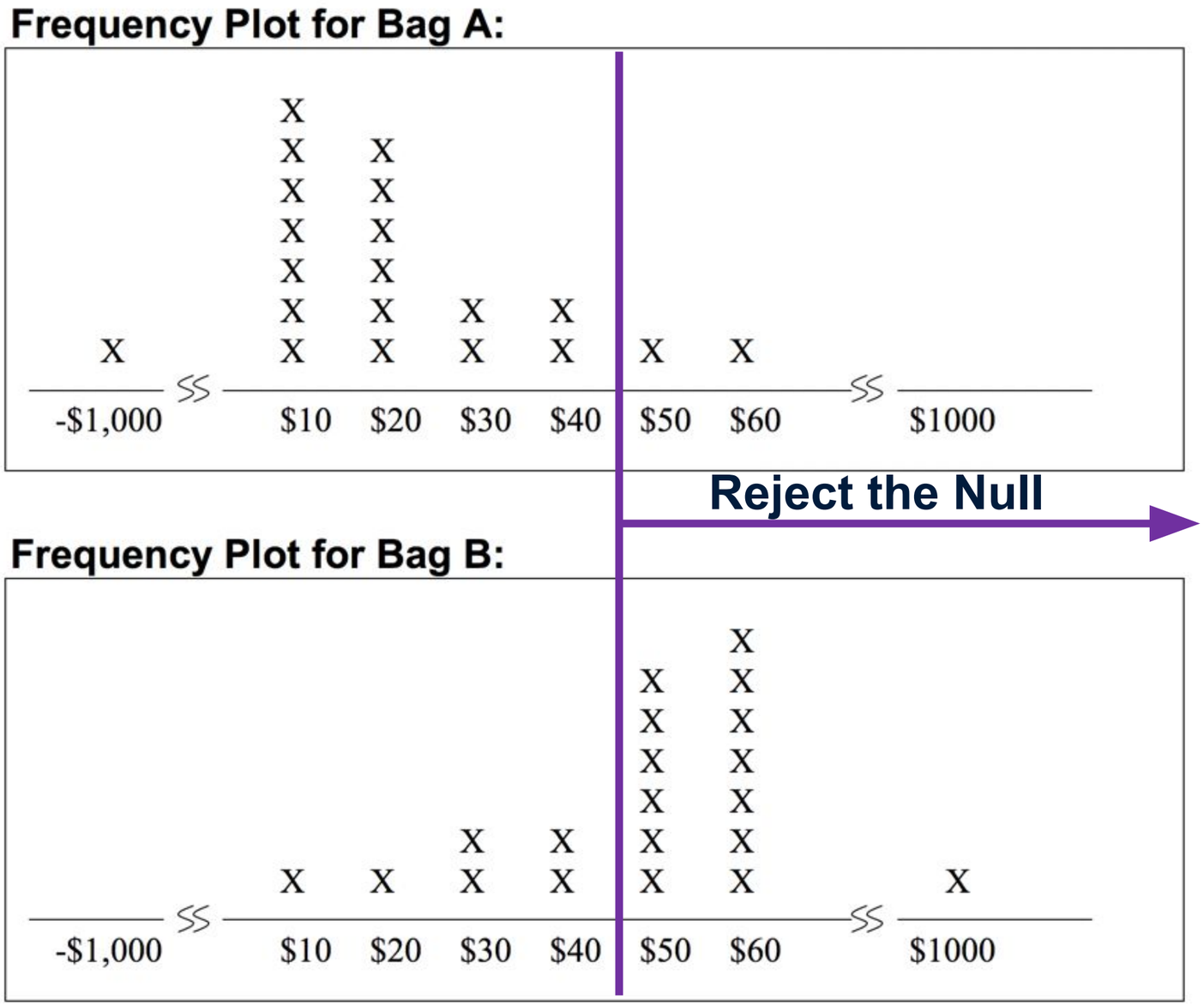
What if select $40 or $30?



Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if voucher is $50 or higher

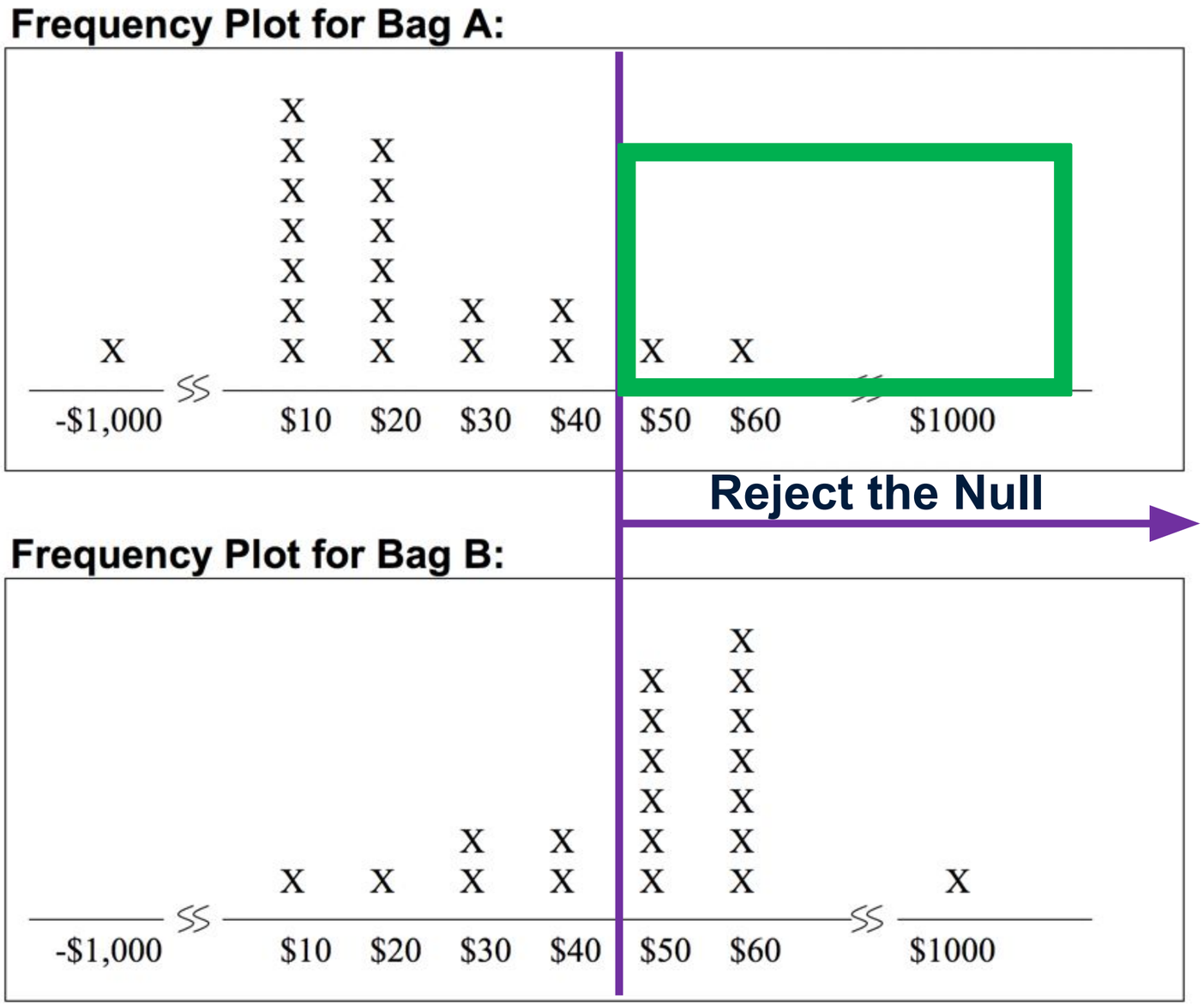


Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if voucher is $50 or higher

Error: Reject Null when Null True

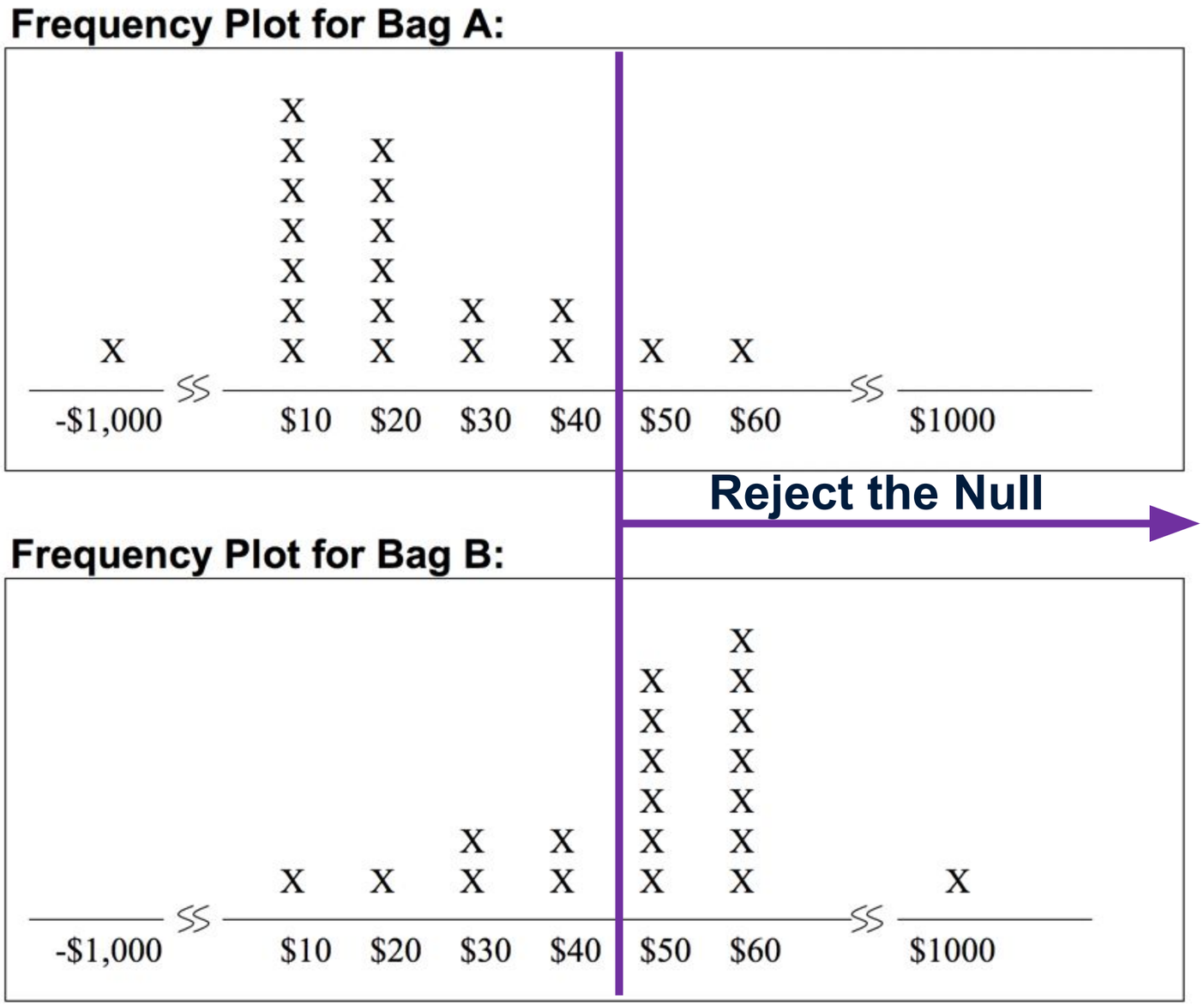


Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if voucher is $50 or higher

Error: Reject Null when Null True

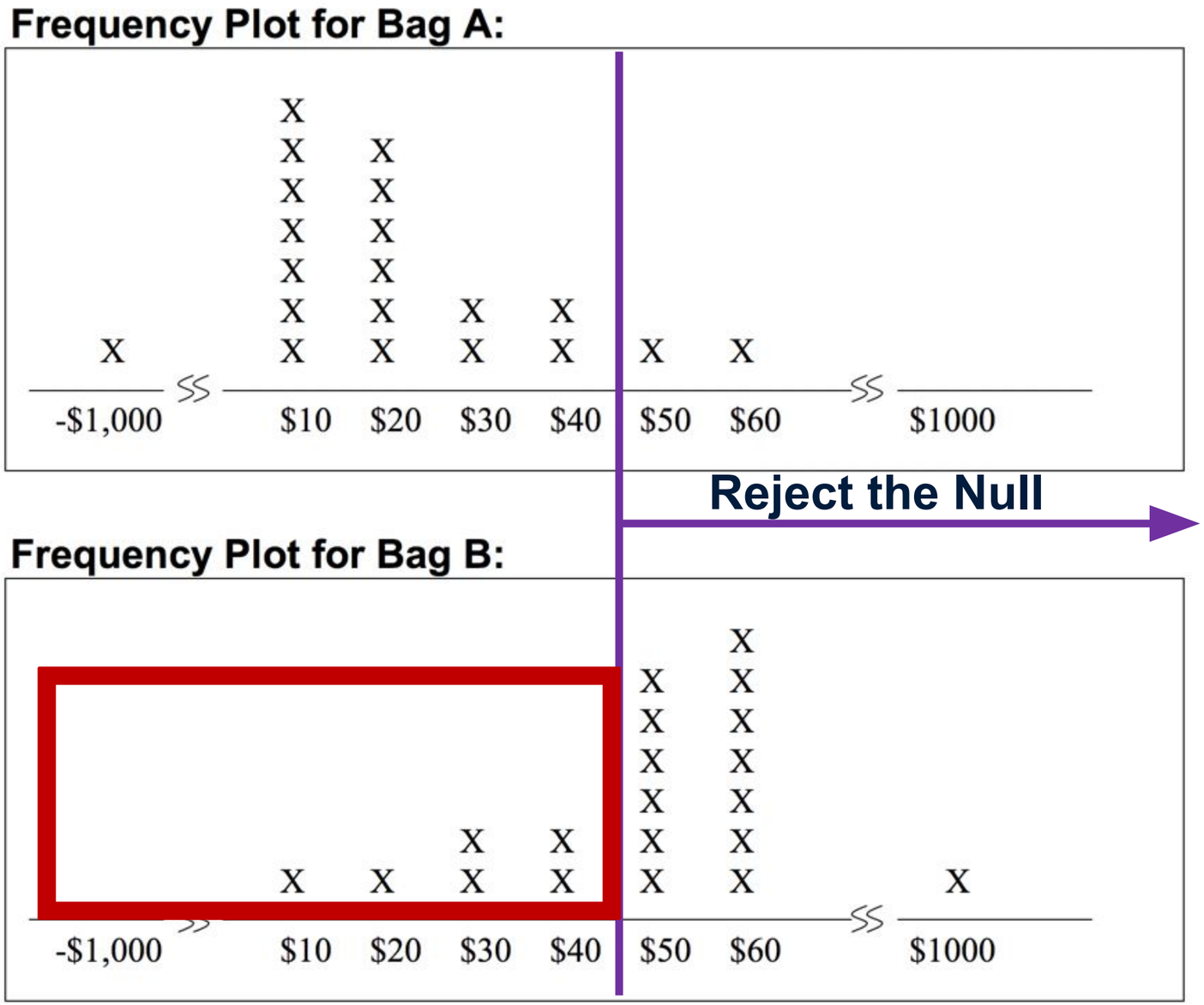


Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if voucher is $50 or higher

Other Error: Do not Reject Null when Alternative True

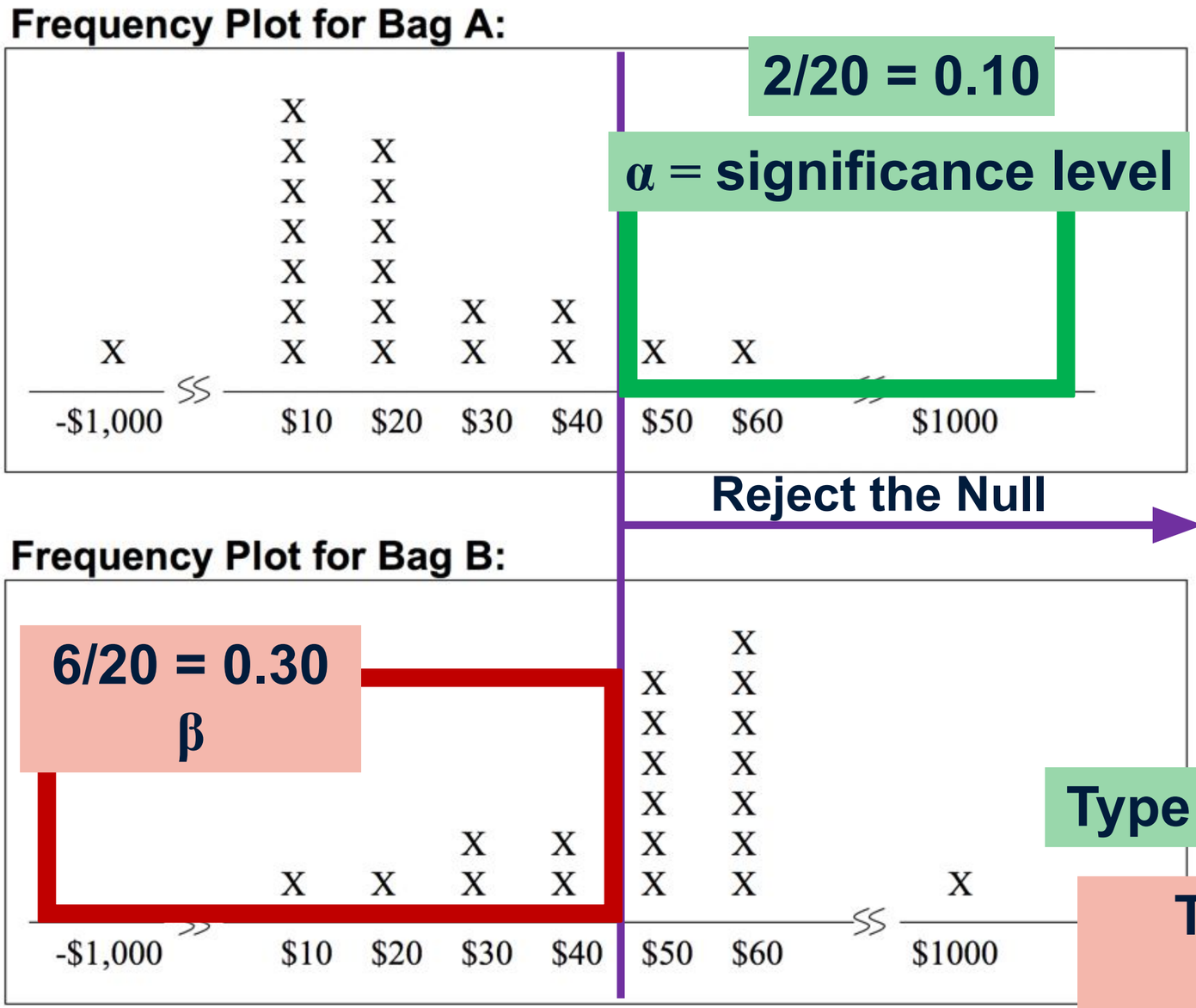


Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if voucher is $50 or higher

Other Error: Do not Reject Null when Alternative True



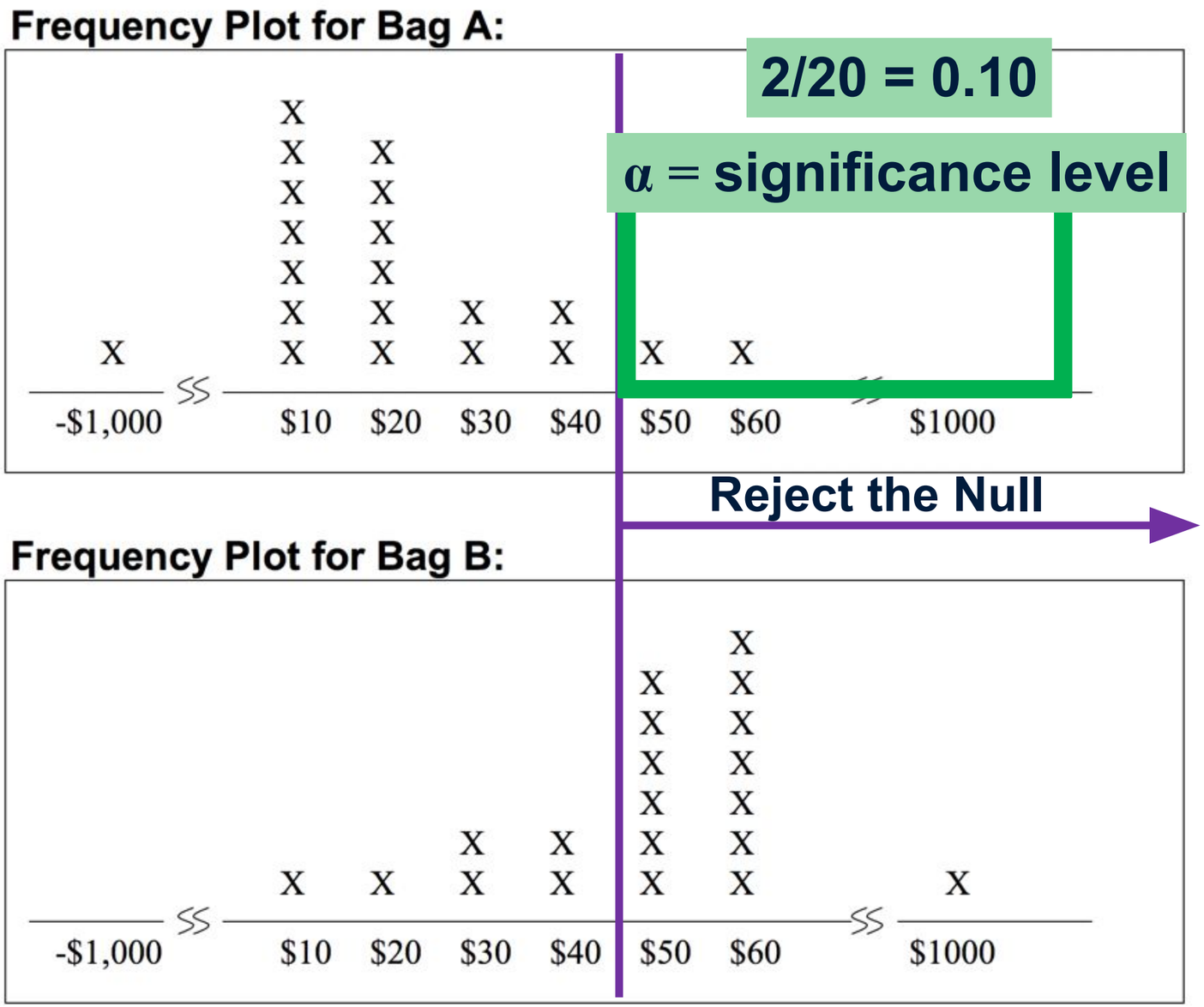
Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if voucher is $50 or higher

Type 1 Error: Reject Null when Null True

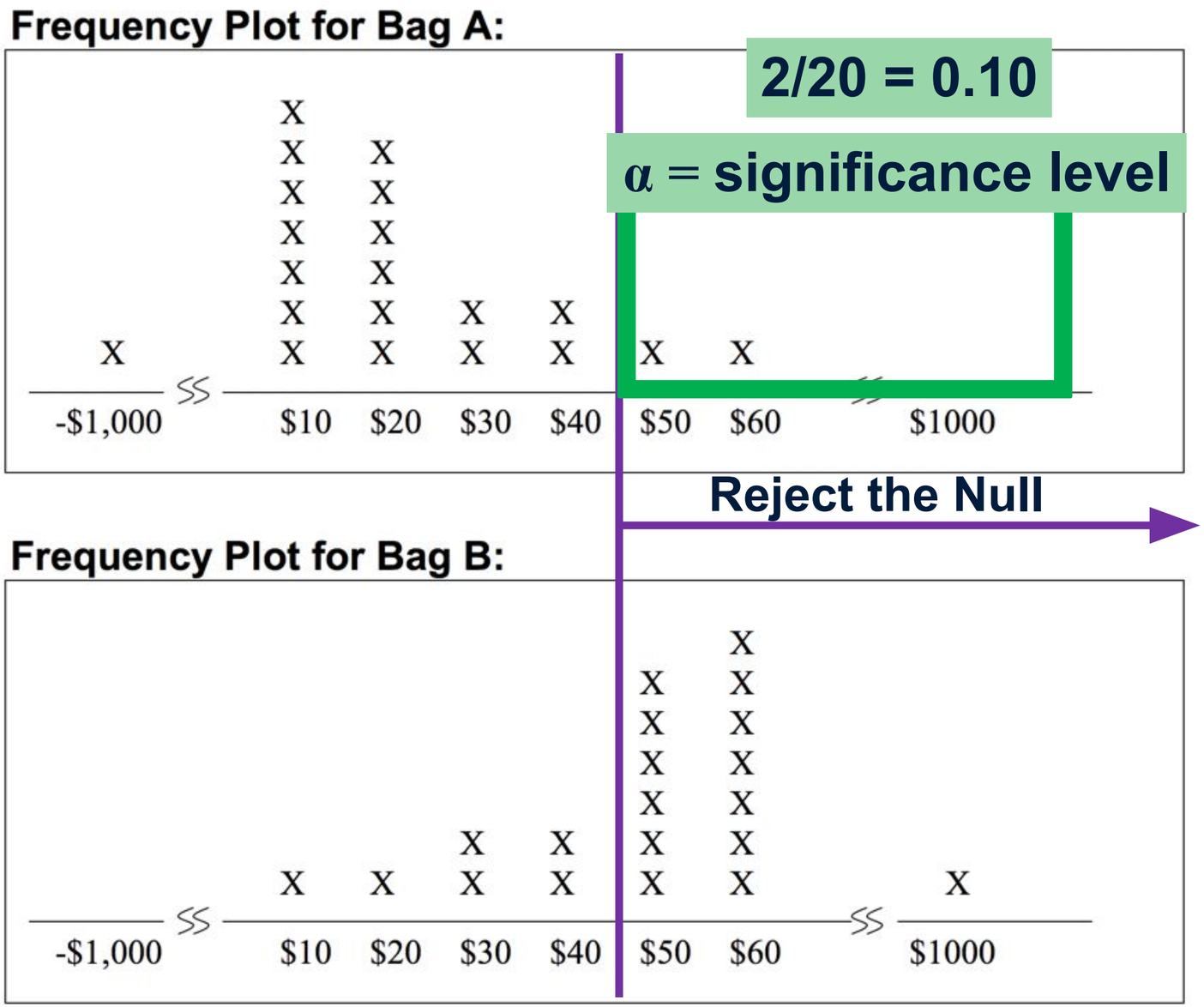
Type 2 Error: Do not Reject Null when Alternative True



Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

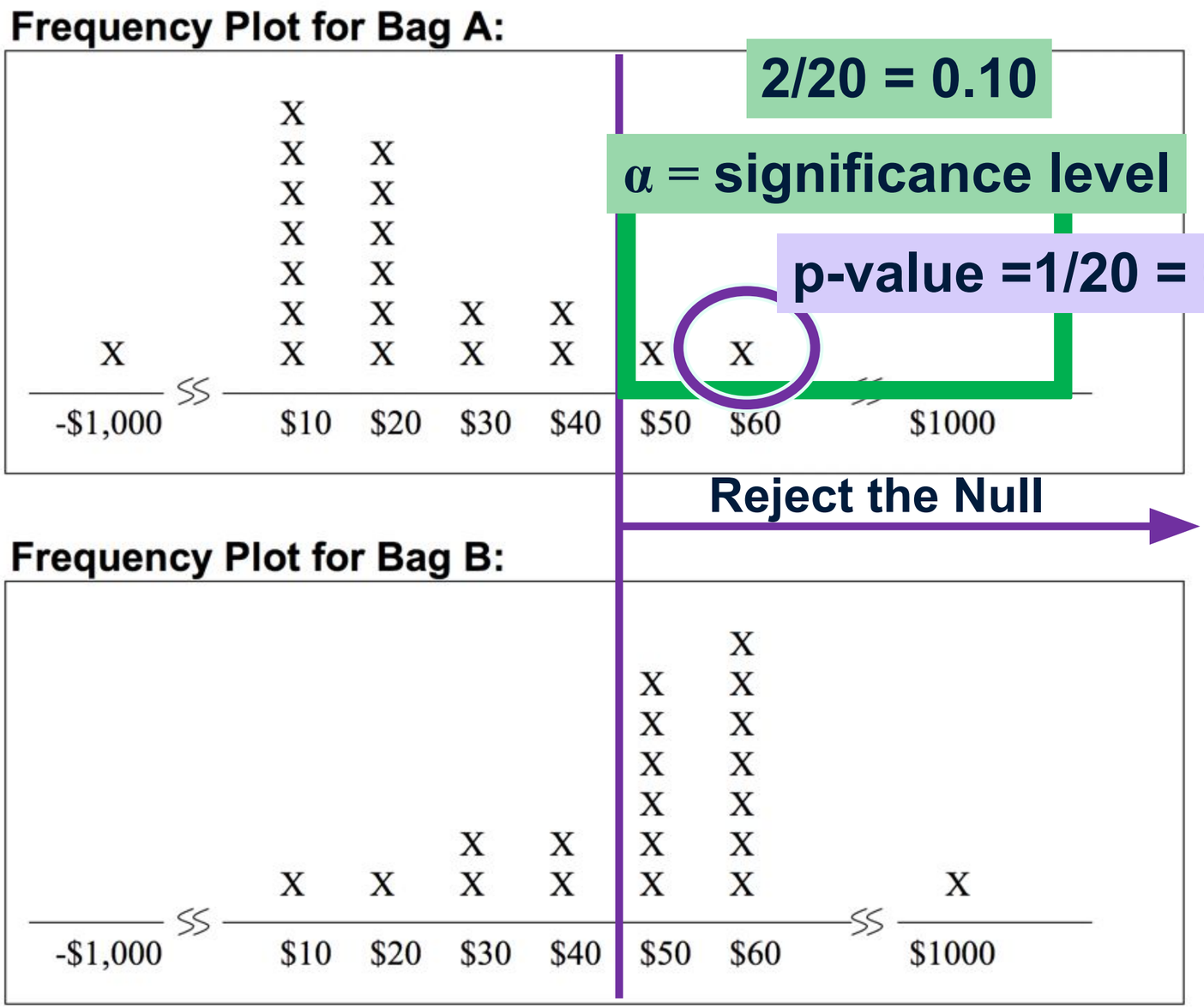
Decision Rule:
Reject the Null if voucher is $50 or higher



Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if p-value is $\leq \alpha$

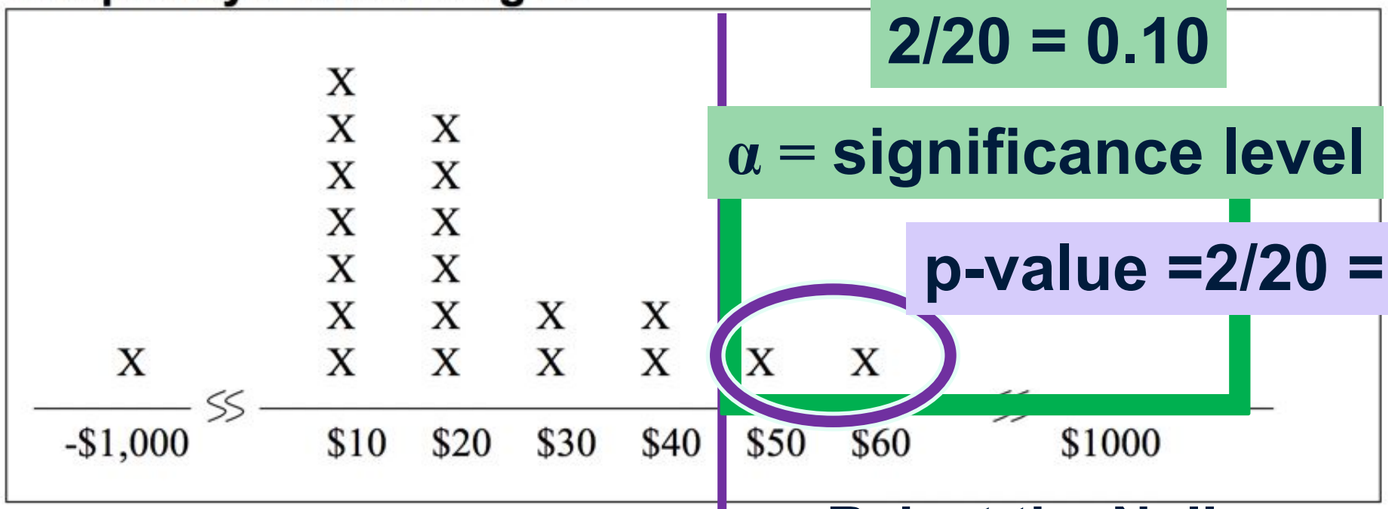


Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if p-value is $\leq \alpha$

Frequency Plot for Bag A:



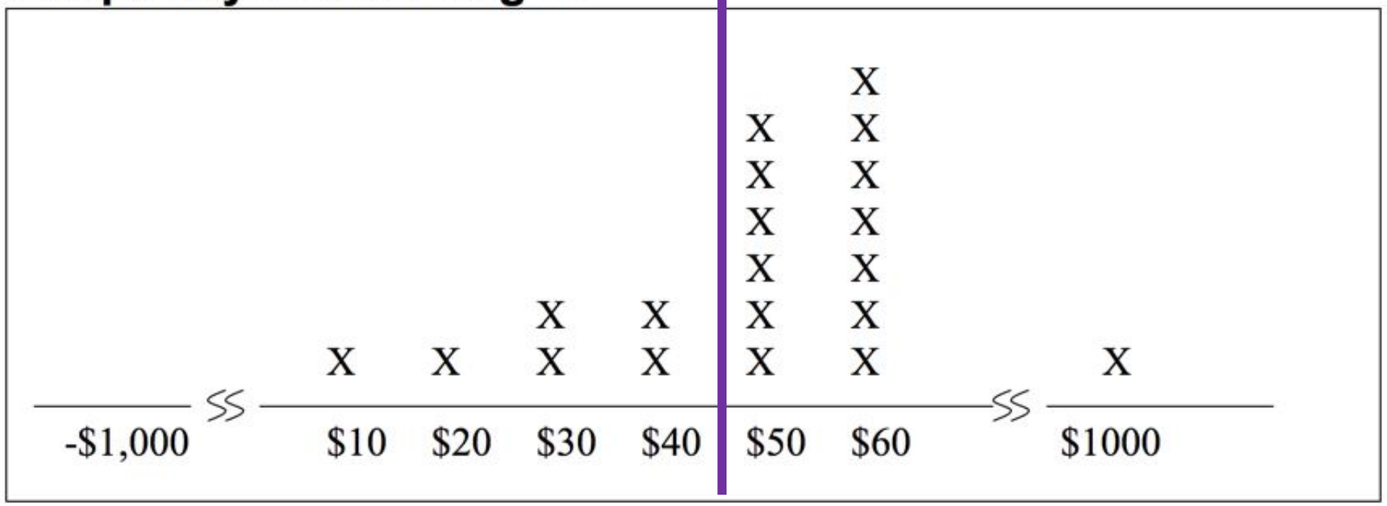
2/20 = 0.10

α = significance level

p-value =2/20 = 0.10

Reject the Null

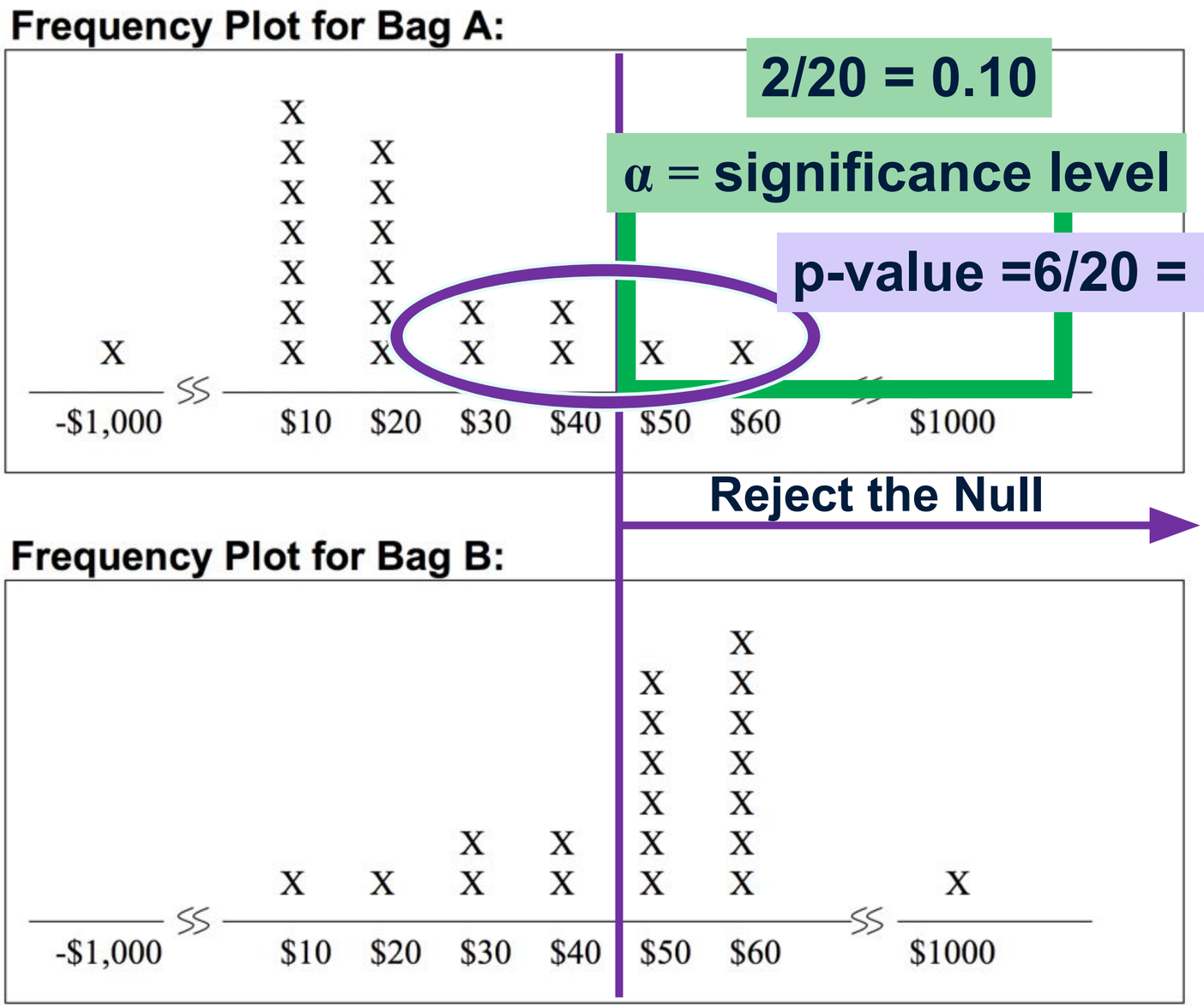
Frequency Plot for Bag B:



Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if p-value is $\leq \alpha$



Null:
Shown bag is **Bag A**

Alternative:
Shown bag is **Bag B**

Decision Rule:
Reject the Null if p-value is $\leq \alpha$

Hypothesis Testing

- Stating Hypotheses
- Selecting a Significance Level
- Using data to make our decision (via p-value)

More details about making inferences ahead!