

**Titanic 1**  
*by Illustrative Mathematics*

On April 15, 1912, the Titanic struck an iceberg and rapidly sank with only 710 of her 2,204 passengers and crew surviving. Data on survival of passengers are summarized in the table below.

	<b>Survived</b>	<b>Did Not Survived</b>	<b>Total</b>
<b>First Class Passengers</b>	<b>201</b>	<b>123</b>	<b>324</b>
<b>Second Class Passengers</b>	<b>118</b>	<b>166</b>	<b>284</b>
<b>Third Class Passengers</b>	<b>181</b>	<b>528</b>	<b>709</b>
<b>Total Passengers</b>	<b>500</b>	<b>817</b>	<b>1317</b>

- a. Calculate the following probabilities. Round your answers to three decimal places.
- If one of the passengers is randomly selected, what is the probability that this passenger was in first class?
  - If one of the passengers is randomly selected, what is the probability that this passenger survived?
  - If one of the passengers is randomly selected, what is the probability that this passenger was in first class and survived?
  - If one of the passengers is randomly selected from the first class passengers, what is the probability that this passenger survived? (That is, what is the probability that the passenger survived, given that this passenger was in first class?)
  - If one of the passengers who survived is randomly selected, what is the probability that this passenger was in first class?
  - If one of the passengers who survived is randomly selected, what is the probability that this passenger was in third class?

b. Why is the answer to part (a.iv) larger than the answer to part (a.iii)?

c. Why is the answer to part (a.v) larger than the answer to part (a.vi)?

d. What other questions can you ask and answer using information in the given table? List at least three.



**Titanic 2**  
by *Illustrative Mathematics*

On April 15, 1912, the Titanic struck an iceberg and rapidly sank with only 710 of her 2,204 passengers and crew surviving. Some believe that the rescue procedures favored the wealthier first class passengers, as is depicted in this scene from the movie Titanic. <http://bit.ly/TitanicData1>

We will use this data in the table below to investigate the validity of such claims.

	Survived	Did Not Survived	Total
First Class Passengers	201	123	324
Second Class Passengers	118	166	284
Third Class Passengers	181	528	709
Total Passengers	500	817	1317

- a. Are the events “passenger survived” and “passenger was in first class” independent events? Support your answer using appropriate probability calculations.
  
  
  
  
  
  
  
  
  
  
- b. Are the events “passenger survived” and “passenger was in third class” independent events? Support your answer using appropriate probability calculations.
  
  
  
  
  
  
  
  
  
  
- c. Did all passengers aboard the Titanic have the same probability of surviving? Support your answer using appropriate probability calculations.



**Titanic 3**  
by *Illustrative Mathematics*

On April 15, 1912, the Titanic struck an iceberg and rapidly sank with only 710 of her 2,204 passengers and crew surviving. Some believe that the rescue procedures favored the wealthier first class passengers. Others believe that the survival rates can be explained by the "women and children first" policy: as is depicted in this scene from the movie Titanic. <http://bit.ly/TitanicWomen>

Data on survival of passengers are summarized in the table below. Investigate what might and might not be concluded from the given data.

	Survived	Did Not Survived	Total
<b>Children in First Class</b>	<b>4</b>	<b>1</b>	<b>5</b>
<b>Women in First Class</b>	<b>139</b>	<b>4</b>	<b>143</b>
<b>Men in First Class</b>	<b>58</b>	<b>118</b>	<b>176</b>
<b>Children in Second Class</b>	<b>22</b>	<b>0</b>	<b>22</b>
<b>Women in Second Class</b>	<b>83</b>	<b>12</b>	<b>95</b>
<b>Men in Second Class</b>	<b>13</b>	<b>154</b>	<b>167</b>
<b>Children in Third Class</b>	<b>30</b>	<b>50</b>	<b>80</b>
<b>Women in Third Class</b>	<b>91</b>	<b>88</b>	<b>179</b>
<b>Men in Third Class</b>	<b>60</b>	<b>390</b>	<b>450</b>
<b>Total</b>	<b>500</b>	<b>817</b>	<b>1317</b>