Probability Formula Solutions

Complement Rule and Addition Rule

T/F Question

A question on a quiz has two possible answers (True/False). If you guess on this question, what's the probability of guessing:

Approximate to the nearest thousandths.

1. Correct?

$$\frac{1}{2} = 0.500$$

2. Incorrect?

$$\frac{1}{2} = 0.500$$

Multiple Choice Question

A multiple choice question has 4 possible answers **a,b,c,d**. If you guess on this question, what is the probability of guessing:

Approximate to the nearest thousandths.

3. Correct?

$$\frac{1}{4} = 0.250$$

4. Incorrect?

$$1 - \frac{1}{4} = 0.750$$

Multiple Choice Question

A multiple choice question has 6 possible answers **a,b,c,d,e,f**. If you guess on this question, what is the probability of guessing:

Approximate to the nearest thousandths.

5. Correct?

$$\frac{1}{6} \approx 0.167$$

6. Incorrect?

$$1 - \frac{1}{6} \approx 0.833$$

Bag of Marbles

A bag contains the following marbles.

Approximate to the nearest thousandths.

6 red
4 yellow
2 blue
1 green

If you select a marble at random, what's the **probability** of selecting a:

Approximate to the nearest thousandths.

7. Non red marble?

$$1 - \frac{6}{13} \approx 0.538$$

8. Non yellow marble?

$$1 - \frac{4}{13} \approx 0.692$$

9. Red and Yellow marble?

$$\frac{0}{13} = 0$$

10. Red or Yellow marble?

$$\frac{6}{13} + \frac{4}{13} - 0 = \frac{10}{13} \approx 0.769$$

11. Blue and green marble?

$$\frac{0}{13} = 0$$

12. Blue or green marble?

$$\frac{2}{13} + \frac{1}{13} - 0 = \frac{3}{13} \approx 0.231$$

Defective iPhone

A box contains 588 iPhones in which 560 are functional. If you select an iPhone at random, what's the probability of selecting:

Approximate to the nearest thousandths.

13. A functional iPhone?

$$\frac{560}{588} \approx 0.952$$

14. Defective iPhone?

$$1 - \frac{560}{588} \approx 0.048$$

Classroom

A class contains 16 boys and 12 girls. If you select a person at random, what's the probability of selecting a:

Approximate to the nearest thousandths.

15. Boy?

$$\frac{16}{28} \approx 0.571$$

16. Girl?

$$\frac{12}{28} \approx 0.429$$

17. Boy or girl?

$$\frac{16}{28} + \frac{12}{28} - \frac{0}{28} = \frac{28}{28} = 1$$

Standard Deck

If you select a card from a standard deck assuming the ace is high, what's the **probability** of selecting a:

Approximate to the nearest thousandths.

18. King of hearts?

$$\frac{1}{52}$$

19. King or heart?

$$\frac{4}{52}+\frac{13}{52}-\frac{1}{52}=\frac{16}{52}\approx 0.308$$

20. Ace and King?

$$\frac{0}{52}=0$$

21. Ace or King?

$$\frac{4}{52}+\frac{4}{52}-\frac{0}{52}=\frac{8}{52}\approx 0.154$$

22. Spade or face card?

$$\frac{13}{52}+\frac{12}{52}-\frac{3}{52}=\frac{22}{52}\approx 0.423$$

23. Club or red card?

$$\frac{13}{52}+\frac{26}{52}-\frac{0}{52}=\frac{39}{52}=0.75$$

Political Affiliation
A class contains the following students based on their political affiliation.

12 Democrats
8 Republicans
4 Independents
2 Peace and Freedom
1 Socialist

If you select a person at random, what's the probability of selecting a student who is a:
Approximate to the nearest thousandths.

24. Non-Democrat?

$$1 - \frac{12}{27} \approx 0.556$$

25. Non-Republican?

$$1 - \frac{8}{27} \approx 0.704$$

26. Non-Socialist?

$$1 - \frac{1}{27} \approx 0.963$$

27. Democrat or Socialist?

$$\frac{12}{27} + \frac{1}{27} - \frac{0}{27} = \frac{13}{27} \approx 0.481$$

28. Republican or Independent?

$$\frac{8}{27} + \frac{4}{27} - \frac{0}{27} = \frac{12}{27} \approx 0.444$$

Titanic Mortality Table

	Men	Women	Boys	Girls	Total
Survived	332	318	29	27	706
Died	1360	104	35	18	1517
Total	1692	422	64	45	2223

If you select a passenger at random, what's the **probability** of selecting a person who:
Approximate to the nearest thousandths.

29. Non-Man?

$$1 - \frac{1692}{2223} \approx 0.239$$

30. Non-Survivor?

$$1 - \frac{706}{2223} \approx 0.682$$

31. Non-Boy?

$$1 - \frac{64}{2223} \approx 0.971$$

32. Man or boy (male)?

$$\frac{1692}{2223} + \frac{64}{2223} - \frac{0}{2223} = \frac{1756}{2223} \approx 0.790$$

33. Woman or girl (female)?

$$\frac{422}{2223} + \frac{45}{2223} - \frac{0}{2223} = \frac{467}{2223} \approx 0.210$$

34. Man or Survived?

$$\frac{1692}{2223} + \frac{706}{2223} - \frac{332}{2223} = \frac{2066}{2223} \approx 0.929$$

35. Woman or Died?

$$\frac{422}{2223} + \frac{1517}{2223} - \frac{104}{2223} = \frac{1835}{2223} \approx 0.825$$