Addition Rule

Mutually exclusive events have no outcomes in common

P(A ^ B) = P(A) + P(B) **P(A^B) = P(A) + P(B) – P(A^B)**

1. Why does the relationship P(A) + P(B) = P(A or B) work only for mutually exclusive events?

2. Timothy is asked to determine the P(iPod or iPhone). He adds the column P(iPad) = 30/72 to the row P(iPhone) = 55/72 and gets 85/72. Because this number exceeds 1 he knows that he has done something wrong. What did he do wrong?

	iPad	Not iPad	Total
iPhone	25	30	55
Not iPhone	5	12	17
Total	30	42	72

3. Determine the probability.

a) P(A) = 0.45 P(B) = 0.56

P(A and B) = 0.2

P(A **or** B) = ________

b) P(A) = 0.3 P(B) = 0.15

Events A and B are mutually exclusive.

P(A **or** B) = ________

c) P(A **or** B) = 0.8

P(A) = 0.6 P(B) = 0.5

P(A **and** B) = ________

d) P(A) = 0.24 P(B) = 0.32

P(A **and** B) = 0

P(A **or** B) = ________

e) P(A) = 0.7 P(B) = 0.4

P(A **and** B) = 0.3

P(A **or** B) = ________

f) P(A **or** B) = 0.6

P(A) = 0.25 P(B) = 0.35

P(A **and** B) = ________

4. Given that events A and B are independent, determine the probabilities.

a) P(A) = 0.3 P(B) = 0.7

P(A **and** B) = ________

P(A **or** B) = ________

b) P(A **and** B) = 0.4 P(B) = 0.5

P(A) = ________

P(A **or** B) = ________

c) P(A) = 0.6 P(B) = 0.35

P(A **and** B) = ________

5. Use the two way frequency table to determine the probabilities.

a) P(Red or Green) = _______

b) P(Green or Yellow) = _______

c) P(Male or Green) = _______

d) P(Female or Yellow) = _______

e) P(Red or Blue or Green) = _______

	Red	Green	Blue	Yellow	Total
Male	15	9	11	2	37
Female	8	12	6	7	33
Total	23	21	17	9	70

bill@hanlonmath.com

6. A 12 sided dice is rolled. Shade the required region and determine the requested probability.

Set A = Factors of 6 = {1, 2, 3, 6}
P(A) = 4/12

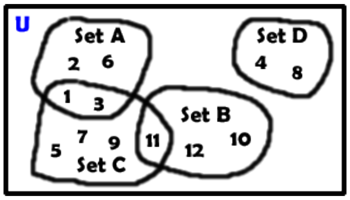
Set B = #'s > 9 = {10, 11, 12}
P(B) = 3/12

Set C = Odd Numbers = {1, 3, 5, 7, 9, 11}
P(C) = 6/12

Set D = (4, 8}
P(C) = 2/12

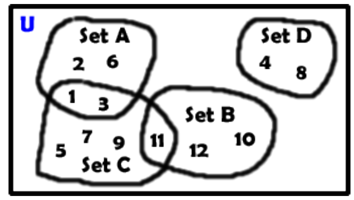
a) Shade Set A ∪ Set B

P(A **or** B) = _________



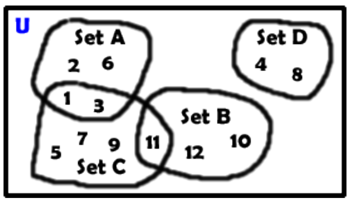
b) Shade Set C ∪ Set D

P(C **or** D) = _________



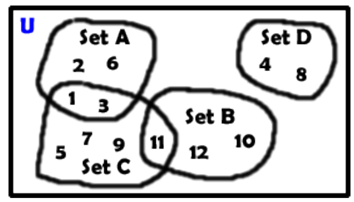
c) Shade Set C ∪ Set B

P(C **or** B) = _________



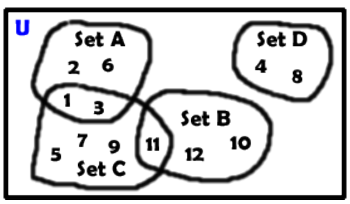
d) Shade Set A ∪ Set D

P(A **or** D) = _________



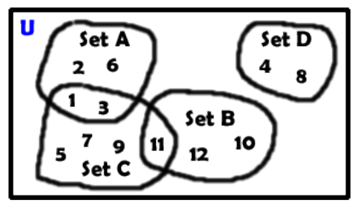
e) Shade Set A ∪ Set C

P(A **or** C) = _________



f) Shade Set B ∪ Set D

P(B **or** D) = _________



7. Use a standard deck of cards to determine the probabilities.

a) P(Red Card or Black King) = __________

b) P(Face Card or Diamond) = ___________

c) P(Ace or 8) = ___________

d) P(Spade or 5) = ___________

e) P(6 or Red Ace) = ___________

f) P(Black Card or 7) = ___________

g) P(Club or Heart) = ___________

h) P(Jack or Red Face Card) = ___________

bill@hanlonmath.com