

Probability of Union of Two Events

Total points = 46

1.

a. P(teenager or adult)
= P(teenager) + P(adult)
 $\frac{24}{120} + \frac{36}{120}$
 $\frac{60}{120}$
 $\frac{1}{2}$

b. P(adult or senior citizen)
= P(adult) + P(senior citizen)
 $\frac{36}{120} + \frac{42}{120}$
 $\frac{78}{120}$
 $\frac{13}{20}$

c. P(child or adult)
= P(child) + P(adult)
 $\frac{18}{120} + \frac{36}{120}$
 $\frac{54}{120}$
 $\frac{9}{20}$
2.

a. P(perfect square or perfect cube)
= P(perfect square) + P(perfect cube) - P(perfect square and perfect cube)
 $\frac{6}{90} + \frac{2}{90} - \frac{1}{90}$
 $\frac{7}{90}$

b. P(divisible by 5 or 10)
= P(divisible by 5) + P(divisible by 10) - P(divisible by 5 and 10)
- c. P(multiple of 5 or multiple of 7)
= P(multiple of 5) + P(multiple of 7) - P(multiple of 5 and 7)
 $\frac{18}{90} + \frac{13}{90} - \frac{2}{90}$
 $\frac{29}{90}$

3.

a. P(double or sum less than 5)
= P(double) + P(sum less than 5) - P(double and sum less than 5)
 $\frac{6}{36} + \frac{6}{36} - \frac{2}{36}$
 $\frac{10}{36}$
 $\frac{5}{18}$

b. P(sum of 5 or sum greater than 4)
= P(sum of 5) + P(sum greater than 4) - P(sum of 5 and sum greater than 4)
 $\frac{4}{36} + \frac{30}{36} - \frac{4}{36}$
 $\frac{30}{36}$
 $\frac{5}{6}$

- c. P(sum less than 4 or greater than 9)
= P(sum less than 4) + P(sum greater than 9)
 $\frac{3}{36} + \frac{6}{36}$
 $\frac{9}{36}$
 $\frac{1}{4}$

4.

a. P(heart or black card)
= P(heart) + P(black card)
 $\frac{13}{52} + \frac{26}{52}$
 $\frac{39}{52}$
 $\frac{3}{4}$

b. P(club or queen)
= P(club) + P(queen) - P(club and queen)
 $\frac{13}{52} + \frac{4}{52} - \frac{1}{52}$
 $\frac{16}{52}$
 $\frac{4}{13}$

c. P(diamond or red card)
= P(diamond) + P(red card) - P(diamond and red card)
 $\frac{13}{52} + \frac{26}{52} - \frac{13}{52}$
 $\frac{26}{52}$
 $\frac{1}{2}$

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 $\frac{18}{90} + \frac{13}{90} - \frac{2}{90}$
 $\frac{29}{90}$

3.

a. P(double or sum less than 5)
= P(double) + P(sum less than 5) - P(double and sum less than 5)
 $\frac{6}{36} + \frac{6}{36} - \frac{2}{36}$
 $\frac{10}{36}$
 $\frac{5}{18}$

b. P(sum of 5 or sum greater than 4)
= P(sum of 5) + P(sum greater than 4) - P(sum of 5 and sum greater than 4)
 $\frac{4}{36} + \frac{30}{36} - \frac{4}{36}$
 $\frac{30}{36}$
 $\frac{5}{6}$

- c. P(sum less than 4 or greater than 9)
= P(sum less than 4) + P(sum greater than 9)
 $\frac{3}{36} + \frac{6}{36}$
 $\frac{9}{36}$
 $\frac{1}{4}$

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 $\frac{13}{52} + \frac{26}{52} - \frac{13}{52}$
 $\frac{26}{52}$
 $\frac{1}{2}$