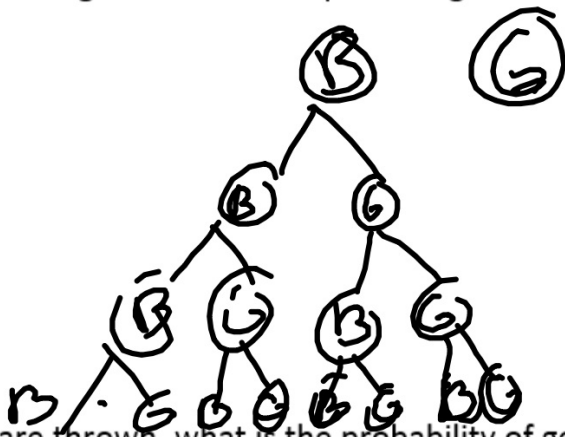
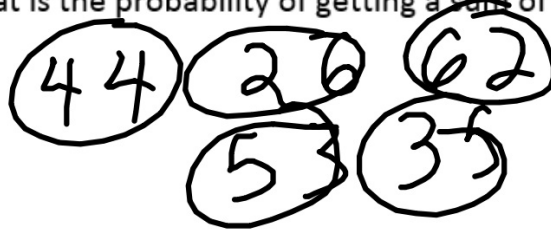


Draw a tree diagram to show all possible gender outcomes when a family has four children.



Two dice are thrown, what is the probability of getting a sum of 8?



$$\frac{5}{36}$$

How many ways can the offices of president, secretary and treasurer be filled from a group of six people?

$${}^6P_3 = \frac{6!}{(6-3)!} = \frac{6 \cdot 5 \cdot 4}{1} = 120$$

how many ways can seven questions out of ten be chosen on an examination?

$$nCr = \frac{n!}{(n-r)!r!} = 10C7 = \frac{10!}{(10-7)!7!} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{3! \cdot 7!}$$

there are 4 freshmen, 3 sophomores, 5 juniors, and 5 seniors to choose from to form a committee. How many ways can someone choose 3 from each class for the committee?

$$4C3 \cdot 3C3 \cdot 5C3 \cdot 5C3 = \frac{4!}{(4-3)!3!} \cdot \frac{3!}{(3-3)!3!} \cdot \frac{5!}{(5-3)!3!} \cdot \frac{5!}{(5-3)!3!} = 4 \cdot 1 \cdot 10 \cdot 10 = 400$$

a drawer are six white gloves, four black gloves, and eight brown gloves. If a glove is picked at random, what is probability that it will be either white or brown?

$$\frac{6}{18} + \frac{8}{18} = \frac{14}{18} = \frac{7}{9}$$

The probability that Joe will solve a certain problem is $\frac{3}{5}$, that Jane will solve it is $\frac{5}{6}$, and that Sam will solve it is $\frac{3}{4}$. What is the probability that Joe and Jane will solve it, and Sam will not solve it?

$$\frac{3}{5} \cdot \frac{5}{6} \cdot \frac{3}{4} \quad \text{In dependent}$$

$$= \frac{45}{120} = \frac{9}{24} = \frac{3}{8}$$

Drawing a card from a standard 52 card deck and choosing a queen or a jack. Are the events mutually exclusive? What is the probability of a queen or a jack?

Yes

$$\frac{4}{52} + \frac{4}{52} = \frac{8}{52} = \frac{2}{13}$$

A pair of 6-sided dice are rolled. The event is doubles or sum of 9. Are the events mutually exclusive? Justify your answer? What is the probability of doubles or sum of 9?

63 34 45 54

$$\frac{6}{36} + \frac{4}{36}$$

$$\frac{10}{36} = \frac{5}{18}$$

you have a 35% chance of making a free throw, what is the probability of missing the free throw?

65%

card is drawn from a standard deck of 52 cards, replaced, and a second card is drawn. What is the probability that both cards are tens?

$$\frac{4}{52} \cdot \frac{4}{52} = \frac{16}{2704} = \frac{1}{169}$$

card is drawn from a standard deck of 52 cards and a second card is drawn without replacement. What is the probability that both cards are tens?

$$\frac{4}{52} \cdot \frac{3}{51} = \frac{12}{2652} = \frac{1}{221}$$

There is a lottery of 1000 tickets; every ticket costs \$2. The lottery has the following prizes: one ticket wins \$300, 10 tickets win \$50 and 25 tickets win a \$10 prize. What is the expected value?

$$\frac{1}{1000} 300 + \frac{10}{1000} 50 + \frac{25}{1000} 10 - \frac{964}{1000} \cdot 2$$

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