

2.7 - Probability of Compound Events

Vocabulary:

- Independent Events
- Dependent Events

→ events that DO NOT influence each other

↘ the 1st event influences the second event

1 EXAMPLE Suppose you roll two number cubes. What is the probability that you will roll an odd number on the first cube and a multiple of 3 on the second cube?

$$P(\text{odd}) \cdot P(\text{multiple of 3})$$

$$\frac{3}{6} \cdot \frac{2}{6}$$

$$\frac{1}{2} \cdot \frac{1}{3} = \frac{1}{6}$$

① 2 ③ 4 ⑤ 6

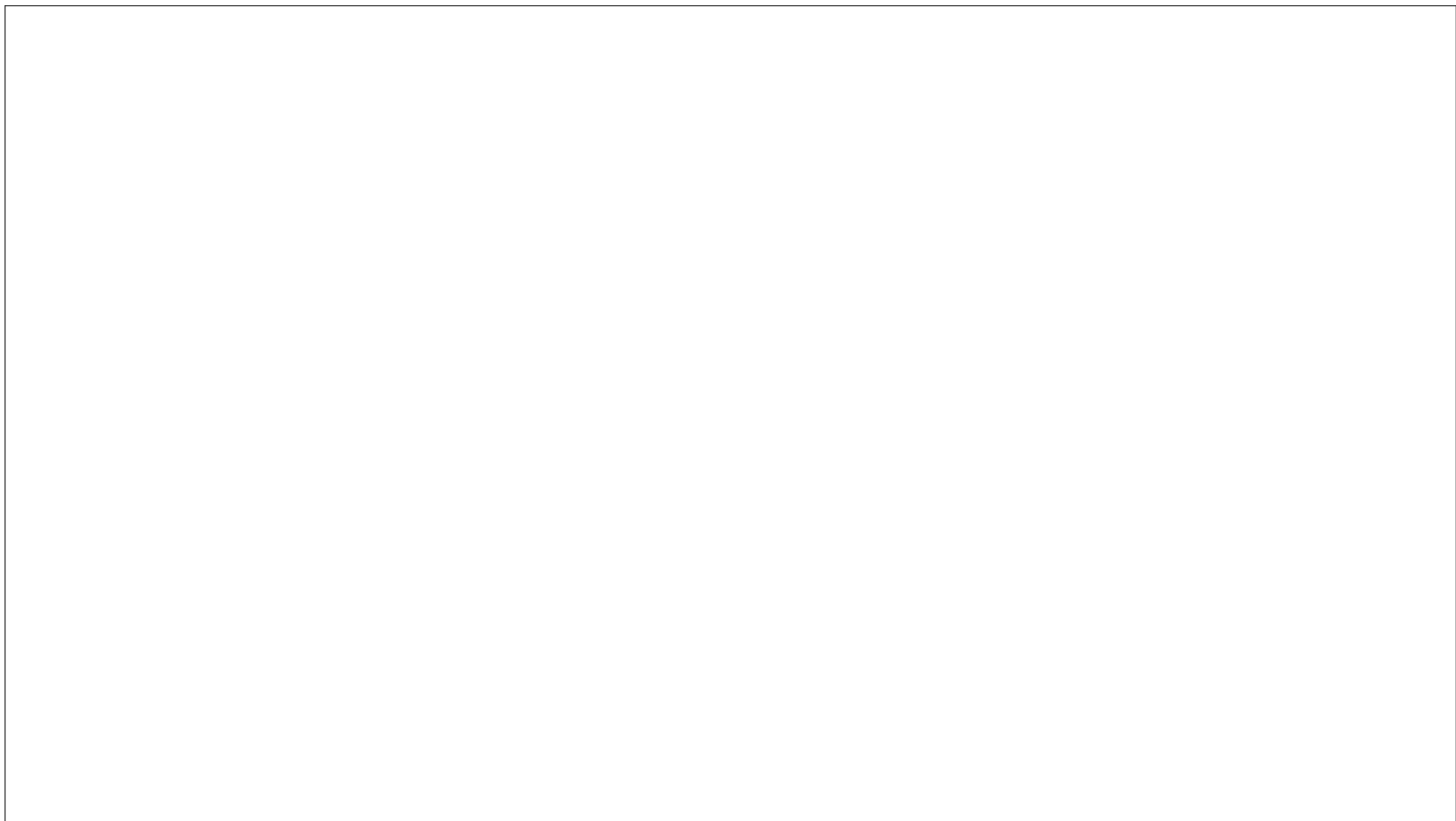
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You roll a blue number cube and a green number cube. Find each probability.

#1. P(blue 1 and green 1) $\frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$

#7. P(blue and green less than 7)

100% or 1



2 EXAMPLE Suppose you have 3 quarters and 5 dimes in your pocket.

You take out one coin, and then put it back. Then you take out another coin. What is the probability that you take out a dime and then a quarter?

Q Q Q
D D D D D

$$P(\text{dime}) \cdot P(\text{quarter})$$

$$\frac{5}{8} \cdot \frac{3}{8} = \frac{15}{64}$$

23%

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Suppose you choose a tile at random from a bag containing 2 A's, 3 B's, and 4 C's. You replace the first tile in the bag and then choose again. Find each probability.

#9. $P(A \text{ and } A)$

$$P(A) \cdot P(A) \\ \frac{2}{9} \cdot \frac{2}{9} = \boxed{\frac{4}{81}}$$

#13. $P(B \text{ and } C)$

$$P(B) \cdot P(C) \\ \frac{3}{9} \cdot \frac{4}{9} = \frac{12}{81} \div 3 = \boxed{\frac{4}{27}}$$

3 EXAMPLE Suppose you have 3 quarters and 5 dimes in your pocket.

You take out one coin, but you do not put it back. Then you take out another coin. What is the probability of first taking out a dime and then a quarter?

QQQ
DDDD~~D~~

$$P(\text{dime}) \cdot P(\text{quarter})$$
$$\frac{5}{8} \cdot \frac{3}{7} = \boxed{\frac{15}{56}}$$

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You select a card at random from those below. Without replacing the card, you choose a second card. Find each probability. Consider Y a vowel.

P R O B ~~A~~ B I L I T Y

#15. P(vowel then vowel) $\frac{15}{11} \cdot \frac{4}{10} = \frac{4}{22} = \frac{2}{11}$

#19 P(A then A) $\frac{1}{11} \cdot 0 = 0$

4 EXAMPLE A teacher must select 2 students for a conference. The teacher randomly picks names from among 3 freshmen, 2 sophomores, 4 juniors, and 4 seniors. What is the probability that a junior and then a senior are chosen?

$$P(\text{junior}) \cdot P(\text{senior after junior})$$

$$\frac{1}{13} \cdot \frac{4}{12} = \frac{4}{39}$$

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#21. Four girls and three boys volunteer to represent their class at a school assembly. The teacher selects one name and then another from a bag containing the seven students' names. What is the probability that both representatives will be girls?

$$P(\text{girl}) \cdot P(\text{girl after girl})$$

$$\frac{4}{7} \cdot \frac{3}{6}$$

$$\frac{\cancel{2}\cancel{4}}{7} \cdot \frac{1}{\cancel{2}_1} = \boxed{\frac{2}{7}}$$

Homework Problems:

pg. 104-106 #25, 31, 37, 41, 44, 55