مدرسة قطر الندى للتعليم الأساسي والثانوي

Qatr AL Nada school

وزارة التربية والتعليم

Revision
Chapter 10

اسم الطالبة:

الصف:

إعداد المعلمة: سعاد عاطف عبدالحفيظ

9	أوجد احتمال وقوع حدث.	مثال 2، b، c، d	735
	Find the probability of an event.	Example 2, b, c, d	

Probability can be written as a fraction, decimal, or percent.

in simplest form

Example 2. Find the probability of rolling a 2, 3, or 4 on the number cube.

{1, 2, 3, 4, 5, 6}

$$P(2, 3 \text{ or } 4) = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3 \div 3}{6 \div 3} = \frac{1}{2}$$

$= 0.5 \times 100\% = 50\%$

The spinner at the right is spun once. Find the probability of each event. Write each answer as a fraction, percent, and decimal.

total = 10

b. $P(F)$

$= \frac{1}{10}$

$= 0.1 \times 100\%$

$= 10\%$

c. $P(D \text{ or } G)$

$P(D) + P(G)$

$\frac{1}{10} + \frac{1}{10}$

$\frac{2}{10} = \frac{1}{5}$

$= 0.2$

$= 20\%$

d. $P(\text{vowel})$ (a e i o u)

$= \frac{3}{10}$

$= 0.3 \times 100$

$= 30\%$

10	أن يجد احتمال عدم وقوع حدث(المتممة).	مثال 3، e	735
	Find the probability of the complementaty of an event.	Example 3, e	

not 1 − 0

100% − □ =

Example **3.** Find the probability of *not* rolling a 6

{1, 2, 3, 4, 5, 6}

P(not 6) = 1 − P(6)

÷6×1 : 1 − 1/6 = 5/6 ✓

6/6 − 1/6 = 5/6 ✓

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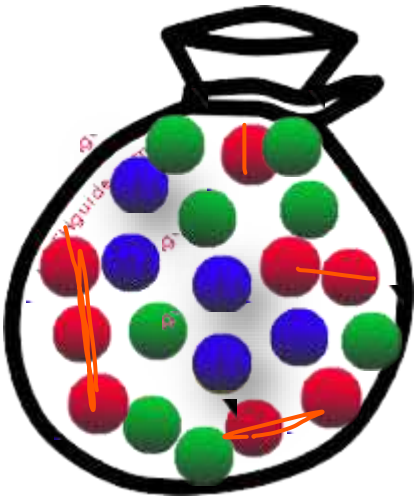
e. A bag contains 5 blue, 8 red, and 7 green marbles. A marble is selected at random. Find the probability the marble is *not* red

total = 5 + 8 + 7 = 20



P(not red) = 1 − P(red)

= 1 − 8/20 = 12/20 ÷4

= 3/5

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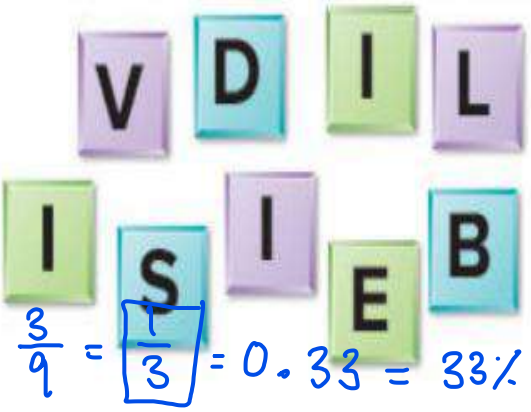
10	أن يجد احتمال عدم وقوع حدث(المتممة).	مثال 3، e	735
	Find the probability of the complementaty of an event.	Example 3, e	

total = 9

A letter tile is chosen randomly. Find the probability of each event. Write each answer as a fraction, percent, and decimal. (Examples 1–3)



1. $P(D) = \frac{1}{9} = 0.1\overline{1} = 11\%$

2. $P(S, V, \text{or } L) = P(S) + P(V) + P(L) = \frac{1}{9} + \frac{1}{9} + \frac{1}{9} = \frac{3}{9} = \boxed{\frac{1}{3}} = 0.33 = 33\%$

3. $P(\text{not } D) = 1 - P(D)$
$= 1 - \frac{1}{9} = \frac{8}{9} = 0.889 = 88.9\%$

The spinner shown is spun once. Find the probability of each event. Write each answer as a fraction, percent, and decimal. (Examples 1–3)

1. $P(\text{blue}) = \frac{2}{8} = \frac{1}{4}$
$0.25 = 25\%$

2. $P(\text{red or yellow})$
$P(\text{red}) + P(\text{yellow})$
$= \frac{2}{8} + \frac{1}{8} = \frac{3}{8} = 0.375$
$= 37.5\%$

3. $P(\text{not brown}) = 1 - P(\text{brown})$
$= 1 - 0$
$= 1 = 100\%$

4. $P(\text{not green})$
$= 1 - P(\text{green})$
$= 1 - \frac{3}{8} = \frac{5}{8} = 0.625$
$= 62.5\%$

① coin → 2 ← H, T

② number cube = 6 {1, 2, 3, 4, 5, 6}

11	أن يجد الاحتمال النظري والاحتمال التجريبي ويقارن بينهما.	1	746
	Find the theoretical and the experimental probability and compare between them.	1	

1. A coin is tossed 50 times, and it lands on picture 28 times. Find the experimental probability and the theoretical probability of the coin landing on picture.

$= \frac{28}{50} = \frac{14}{25} = 0.56$ $= \frac{1}{2} = 0.50$

Experimental probability and theoretical probability are close.

not close: 0.56 ✓, 0.4 ✓

1 A number cube is rolled 20 times and lands on 1 two times and on 5 four times. Find each experimental probability.

a. landing on 5

$P(5) = \frac{4}{20} = \frac{1}{5} = 0.2 \times 100\% = 20\%$

b. *not* landing on 1

$P(1) = \frac{2}{20} = \frac{1}{10} = 0.1 \times 100\% = 10\%$

$P(\text{not } 1) = 1 - P(1) = \frac{20}{20} \times 1 - \frac{2}{20} = \frac{18}{20} = \frac{9}{10}$ ✓

2. The spinner at the right is spun 12 times. It lands on blue 1 time.

a. What is the experimental probability of the spinner landing on blue?

experimental $P(\text{blue}) = \frac{1}{12}$

Theoretical $P(\text{blue}) = \frac{1}{4}$

12	أن يجد الفضاء العيني لتجربة مكونة من أكثر من حدث.	1, 2	758
	To find the sample space of experiment from more than one event.	1, 2	

For each situation, find the sample space.

1. A coin is tossed twice.

1 coin 2 coin

2 X 2 = 4

H < H — HH
  T — HT

T < H — TH
  T — TT

P(HT) = 1/4

2. A pair of brown or black sandals are available in sizes 7, 8, or 9.

2 X 3 = 6

Br < 7 — Br7
  8 — Br8
  9 — Br9

BL < 7 — BL7
  8 — BL8
  9 — BL9

Let Br represent Brown
BL represent Black

12	أن يجد الفضاء العيني لتجربة مكونة من أكثر من حدث.	1, 2	758
	To find the sample space of experiment from more than one event.	1, 2	

For each situation, find the sample space. (Examples 1–2)

1. tossing a coin and spinning the spinner at the right

2 × 5 = 10

H: 1 — H1, 2 — H2, 3 — H3, 4 — H4, 5 — H5

T: 1 — T1, 2 — T2, 3 — T3, 4 — T4, 5 — T5

2. picking a number from 1 to 5 and choosing the color red, white, or blue

5 × 3 = 15

R: 1 — R1, 2 — R2, 3 — R3, 4 — R4, 5 — R5

W: 1 — W1, 2 — W2, 3 — W3, 4 — W4, 5 — W5

B: 1 — B1, 2 — B2, 3 — B3, 4 — B4, 5 — B5

3. choosing a purple, green, black, or silver bike having 10, 18, 21, or 24 speeds

P G B S

4 × 4 = 16

{ P10 , P18 , P21 , P24
G10 , G18 , G21 , G24
B10 , B18 , B21 , B24
S10 , S18 , S21 , S24 }

4. choosing a letter from the word SPACE and choosing a consonant from the word MATH

5 × 4 = 20

S: M, A, T, H
P: M, A, T, H
A: M, A, T, H
C: M, A, T, H
E: M, A, T, H

{ SM, SA, ST, SH
PM, PA, PT, PH
AM, AA, AT, AH
CM, CA, CT, CH
EM, EA, ET, EH }

إعداد المعلمة: سعاد عاطف عبدالحفيظ

13	أن يجد احتمال أحداث مركبة.	(مثال 4) ، 3	758
	Find the probability of compound evsnts.	(Example 4) , 3	

Example **4.** To win a carnival prize, you need to choose one of 3 doors labeled 1 through 3. Then you need to choose a red, yellow, or blue box behind each door. What is the probability that the prize is in the blue or yellow box behind door 2?

Outcomes	
door 1	red box
door 1	yellow box
door 1	blue box
door 2	red box
door 2	yellow box
door 2	blue box
door 3	red box
door 3	yellow box
door 3	blue box

total outcomes = 9

$P(\text{blue or yellow}) = \frac{1}{9} + \frac{1}{9}$

$= \frac{2}{9}$

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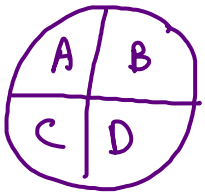
3. Khalaf spins a spinner with four equal sections, labeled A, B, C, and D, twice. If letter A is spun at least once, Khalaf wins. Otherwise, Khalifa wins. Use a list to find the sample space. Then find the probability that Khalifa wins. (Examples 3–4)



not

{AA, AB, AC, AD, BA, BB, BC, BD, CA, CB, CC, CD, DA, DB, DC, DD}

$P(\text{not win}) = 1 - P(\text{at least A})$

(otherwise)

$= 1 - \frac{7}{16} = \boxed{\frac{9}{16}}$

14	أن يحل مسائل حياتية على إيجاد احتمال أحداث مركبة.	5, 6	759
	Solve real-world problems on the probability of compound events.	5, 6	

For each game, find the sample space. Then find the indicated probability. (Examples 3–4)

5. Hessa tosses 2 number cubes. She wins if she rolls double sixes.

Find *P*(Hessa wins).

(6,6)

$6 \times 6 = 36$

$P(\text{double six}) = \frac{1}{36}$

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6. Jamal rolls a number cube, tosses a coin, and chooses a card from two cards marked A and B. If an even number and heads appears, Jamal wins, no matter which card is chosen. Otherwise Ismail wins.

$6 \times 2 \times 2 = 24$

Find *P*(Jamal wins).

number cube = 6 , coin = 2 , card = 2

{1HA, 1HB, 1TA, 1TB, 2HA, 2HB, 2TA, 2TB, 3HA, 3HB, 3TA
3TB, 4HA, 4HB, 4TA, 4TB, 5HA, 5HB, 5TA, 5TB, 6HA,
6HB, 6TA, 6TB}

$P(\text{even and head}) = \frac{6}{24} = \frac{1}{4}$

15	وصف نموذج يمكن استخدامه لمحاكاة تجربة معطاة.	a ، (مثال1)	764
	Describe amodel that could be used to simulate a given experiment.	(Example 1) , a	

Example 1. A cereal company is placing one of eight different trading cards in its boxes of cereal. If each card is equally likely to appear in a box of cereal, describe a model that could be used to simulate the cards you would find in 15 boxes of cereal.

* tossing 3 coins

* Repeat 15 times

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a. A restaurant is giving away 1 of 5 different toys with its children's meals. If the toys are given out randomly, describe a model that could be used to simulate which toys would be given with 6 children's meals.

Use a spinner with equal 5 sections assigning each toys as a section , then spin the spinner 6 times

15	وصف نموذج يمكن استخدامه لمحاكاة تجربة معطاة.	a ، (مثال1)	764
	Describe amodel that could be used to simulate a given experiment.	(Example 1) , a	

1. An ice cream store offers waffle cones or sugar cones. Each is equally likely to be chosen. Describe a model that could be used to simulate this situation. Based on your simulation, how many people must order an ice cream cone in order to sell all possible combinations? (Examples 1 and 2)

→ Toss a coin

→ Repeat the simulation until all possible cones are obtained.

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1. The questions on a multiple-choice test each have 4 answer choices. Describe a model that you could use to simulate the outcome of guessing the correct answers to a 50-question test. (Example 1)

→ Use a spinner with 4 equal sections.

→ repeat 50 times

16	إيجاد عدد نتائج تجربة مكونة من أحداث مركبة.	b ، (مثال 2، 3)	781
	Find the number of the outcomes of an expariment consisting of compound events.	(Example 2, 3) , b	

Example 2. Find the total number of outcomes from rolling a number cube with sides labeled 1–6 and choosing a letter from the word NUMBERS. Then find the probability of rolling a 6 and choosing an M.

total = $6 \times 7 = 42$

$P(6 \text{ and } M) = \frac{1}{42} = 0.02\%$

$= 2\%$ unlikely

Example 3. Find the number of different jeans available at The Jeans Shop. Then find the probability of randomly selecting a size 32 × 34 slim fit. Is it likely or unlikely that the jeans would be chosen?

The Jeans Shop

Waist Size	Length (in.)	Style
30	30	slim fit
32	32	bootcut
34	34	loose fit
36		
38		

total out comes = $5 \times 3 \times 3 = 45$

$P(32 \times 34) = \frac{1}{45} = 0.02 = 2\%$ unlikely

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b. Two number cubes are rolled. What is the probability that the sum of the numbers on the cubes is 12? How likely is it that the sum would be 12? total = $6 \times 6 = 36$

$P(\text{sum } 12) = \frac{1}{36} = 0.03$

$= 3\%$ unlikely

SECOND DIE

FIRST DIE	⚀	⚁	⚂	⚃	⚄	⚅
⚀	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
⚁	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
⚂	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
⚃	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
⚄	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
⚅	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

17	استخدام التباديل في إيجاد الأحتمالات في مواقف من الحياة اليومية .	(مثال5) ، F	790
	Use permutations to find the probabilities of real-world situations .	(Example 5) , F	

Example

5. A swimming event features 8 swimmers. If each swimmer has an equally likely chance of finishing in the top two, what is the probability that Fatheya will be in first place and Shaima in second place?

order important

Swimmers	
Abeer	Fawzia
Laila	Shaima
Fatema	Ayesha
Fatheya	Maha

total outcomes = 8

$P(8,2) = 8 \times 7 = 56$

$P(\text{Fatheya , Shaima}) = \frac{1}{56}$

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f. Two different letters are randomly selected from the letters in the word *math*. What is the probability that the first letter selected is *m* and the second letter is *h*?

total outcomes = 4

$P(4,2) = 4 \times 3 = 12$

$P(m , h) = \frac{1}{12}$

إعداد المعلمة: سعاد عاطف عبدالحفيظ

17	استخدام التباديل في إيجاد الأحتمالات في مواقف من الحياة اليومية .	(مثال5) ، F	790
	Use permutations to find the probabilities of real-world situations .	(Example 5) , F	

3. Manal, Najla, and two of their friends will sit in a row at a baseball game. If each friend is equally likely to sit in any seat, what is the probability that Manal will sit in the first seat and Najat will sit in the second seat?

total outcomes = 4

$P(4,2) = 4 \times 3 = 12$

$P(\text{Manal}, \text{Najat}) = \frac{1}{12}$

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6. You have five seasons of your favorite TV show on DVD. If you randomly select two of them from a shelf, what is the probability that you will select season one first and season two second?

total outcomes = 5

$P(5,2) = 5 \times 4 = 20$

$P(\text{season 1}, \text{season 2}) = \frac{1}{20}$

17	استخدام التباديل في إيجاد الأحتمالات في مواقف من الحياة اليومية .	(مثال5) ، F	790
	Use permutations to find the probabilities of real-world situations .	(Example 5) , F	

19. The members of the Evergreen Junior High Quiz Bowl team are listed in the table. If a captain and an assistant captain are chosen at random, what is the probability that Saleh is selected as captain and Abdulrahman as co-captain?

Evergreen Junior High Quiz Bowl Team	
Adnan	Tarek
Hareb	Abdulrahman
Humaid	Abdulraheem
Sultan	Abdulaziz
Saleh	Abdulkarim

total outcomes = 10

$P(10,2) = 10 \times 9 = 90$

$P(\quad) = \frac{1}{90}$

20. Tarek, Eissa, Faleh, and Majed are playing a video game. If they each have an equally likely chance of getting the highest score, what is the probability that Majed will get the highest score and Tarek the second highest? total outcomes = 4

$P(4,2) = 4 \times 3 = 12$

$P(\text{Majed, Tarek}) = \frac{1}{12}$

21. A child has wooden blocks with the letters shown. Find the probability that the child randomly arranges the letters in the order TIGER. total outcomes = 5

$P(5,5) = 5 \times 4 \times 3 \times 2 \times 1 = 120$

$P(\text{TIGER}) = \frac{1}{120}$

18	أن يجد احتمال وقوع الأحداث غير المستقلة.	مثال 3. c ,b	800
	Find the probability of dependent events.	Example 3, c, b	

Example **3.** There are 4 oranges, 7 bananas, and 5 apples in a fruit basket. Mansour selects a piece of fruit at random and then Mahmoud selects a piece of fruit at random. Find the probability that two apples are chosen.

total outcomes = $4+7+5=16$

$P(\text{two apple}) = P(\text{apple then apple}) = \frac{5}{16} \times \frac{4}{15}$

$= \frac{1}{12}$

Find each probability.

b. P(two bananas) =

$P(\text{banana then banana}) = \frac{7}{16} \times \frac{6}{15} = \frac{7}{40}$

c. P(orange then apple)

$\frac{4}{16} \times \frac{5}{15} = \frac{1}{12}$

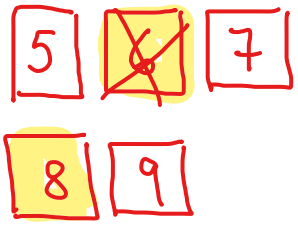
18	أن يجد احتمال وقوع الأحداث غير المستقلة.	مثال 3. c ,b	800
	Find the probability of dependent events.	Example 3, c, b	

even = 2,4,6,8

3. Cards labeled 5, 6, 7, 8, and 9 are in a stack. A card is drawn and not replaced. Then, a second card is drawn at random. Find the probability of drawing two even numbers.

$P(\text{even}) = \frac{2}{5} \times \frac{1}{4} = \frac{2}{20}$

$= \frac{1}{10}$



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6. A standard set of dominoes contains 28 tiles, with each tile having two sides of dots from 0 to 6. Of these tiles, 7 have the same number of dots on each side. If four players each randomly choose a tile, without replacement, what is the probability that each chooses a tile with the same number of dots on each side? (Example 3)

total = 28

$\frac{7}{28} \times \frac{6}{27} \times \frac{5}{26} \times \frac{4}{25} = \frac{1}{585}$

18	أن يجد احتمال وقوع الأحداث غير المستقلة.	مثال 3. c ,b	800
	Find the probability of dependent events.	Example 3, c, b	

Mrs. Huda class has 5 students with blue eyes, 7 with brown eyes, 4 with hazel eyes, and 4 with green eyes. Two students are selected at random. Find each probability. (Example 3) total = 5+7+4+4 = 20

7. *P*(green then brown) _____

P(green) x P(brown) = $\frac{4}{20} \times \frac{7}{19} = \frac{7}{95}$

8. *P*(two blue) _____

P(blue) x P(blue) = $\frac{5}{20} \times \frac{4}{19} = \frac{1}{19}$

9. *P*(hazel then blue) = $\frac{4}{20} \times \frac{5}{19} = \frac{1}{19}$

10. *P*(brown then blue) = $\frac{7}{20} \times \frac{5}{19} = \frac{7}{76}$