

Mathematics

Questionnaire ב'

מתמטיקה

שאלון ב'

Instructions for examinees

א. Duration of the exam: One and a half hours

ב. Exam structure and breakdown of points:

This exam has six questions.

Each question is worth 25 points.

You may answer as many questions as you like,
but the maximum number of points you can earn
is 100.

ג. Material that may be used during the exam:

(1) A non-graphing calculator. You may not use
the programming options of a programmable
calculator. Use of a graphing calculator
or programming options may lead to the
disqualification of the exam.

(2) Formula sheets (attached)

(3) A Hebrew-foreign language /
foreign language-Hebrew dictionary

ד. Special instructions:

(1) **Write all of your calculations and answers
in the test booklet.**

(2) For draft paper, use the test booklet (including
the pages at the end of the booklet) or paper you
receive from the proctors.

Use of other draft paper may lead to the
disqualification of the exam.

(3) Explain all of your work, including
calculations, in detail and in a clear and
organized fashion.

Lack of detail may lower your score or lead to
the disqualification of the exam.

**Note! You may answer in your mother tongue only
if you have the special permission slip with you.**

הוראות לנבחן

א. משך הבחינה: שעה וחצי.

ב. מבנה השאלון ומפתח ההערכה:

בשאלון זה שש שאלות.

לכל שאלה – 25 נקודות.

מותר לך לענות על מספר שאלות כרצונך, אך סך
הנקודות שתוכל לצבור לא יעלה על 100.

ג. חומר עזר מותר בשימוש:

(1) מחשבון לא גרפי. אין להשתמש

באפשרויות התכנות במחשבון

הניתן לתכנות. שימוש במחשבון גרפי או

באפשרויות התכנות במחשבון עלול לגרום

לפסילת הבחינה.

(2) דפי נוסחאות (מצורפים).

(3) מילון עברי-לועזי/לועזי-עברי.

ד. הוראות מיוחדות:

(1) **כתוב את כל החישובים והתשובות**

בגוף השאלון.

(2) לטייטה יש להשתמש בדפים שבגוף

השאלון (כולל הדפים שבסופו) או

בדפים שקיבלת מהמשגיחים.

שימוש בטייטה אחרת עלול לגרום

לפסילת הבחינה.

(3) הסבר את כל פעולותיך, כולל חישובים,

בפירוט ובצורה ברורה ומסודרת.

חוסר פירוט עלול לגרום לפגיעה בציון

או לפסילת הבחינה.

בהצלחה!

/המשך מעבר לדף/

Good Luck!

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Questions

This exam has six questions. A complete answer is worth 25 points. You may answer as many questions as you like, completely or partially, but the maximum number of points you can earn is 100.

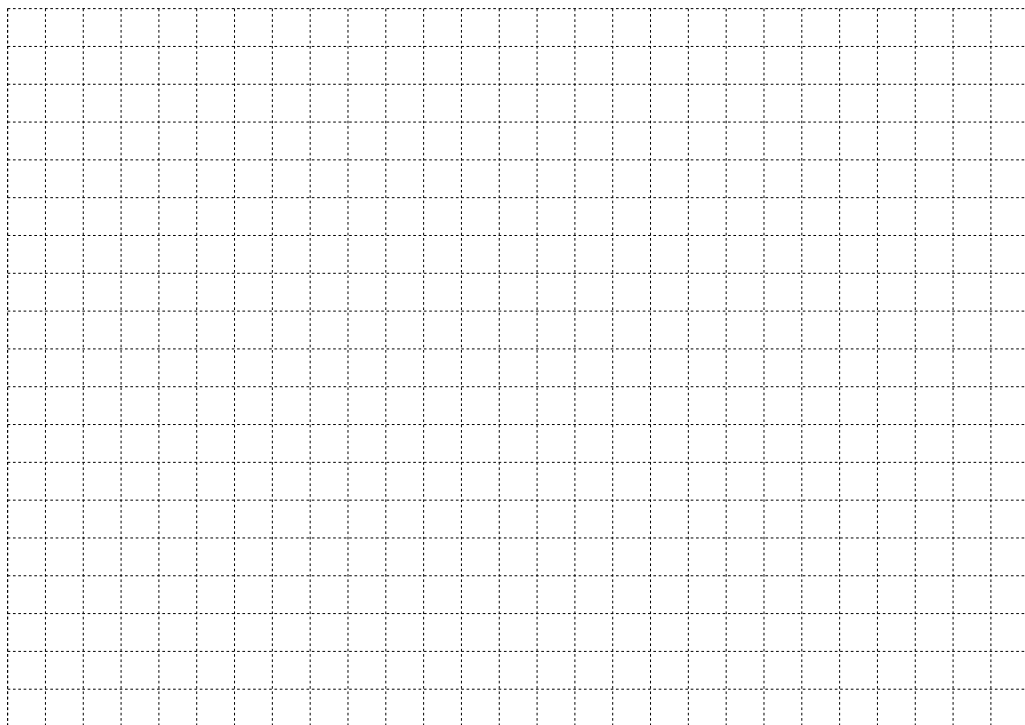
Write all of your calculations and answers in the test booklet.

Note! Explain all of your work, including calculations, clearly and in detail.

Lack of detail may lower your score or lead to the disqualification of your exam.

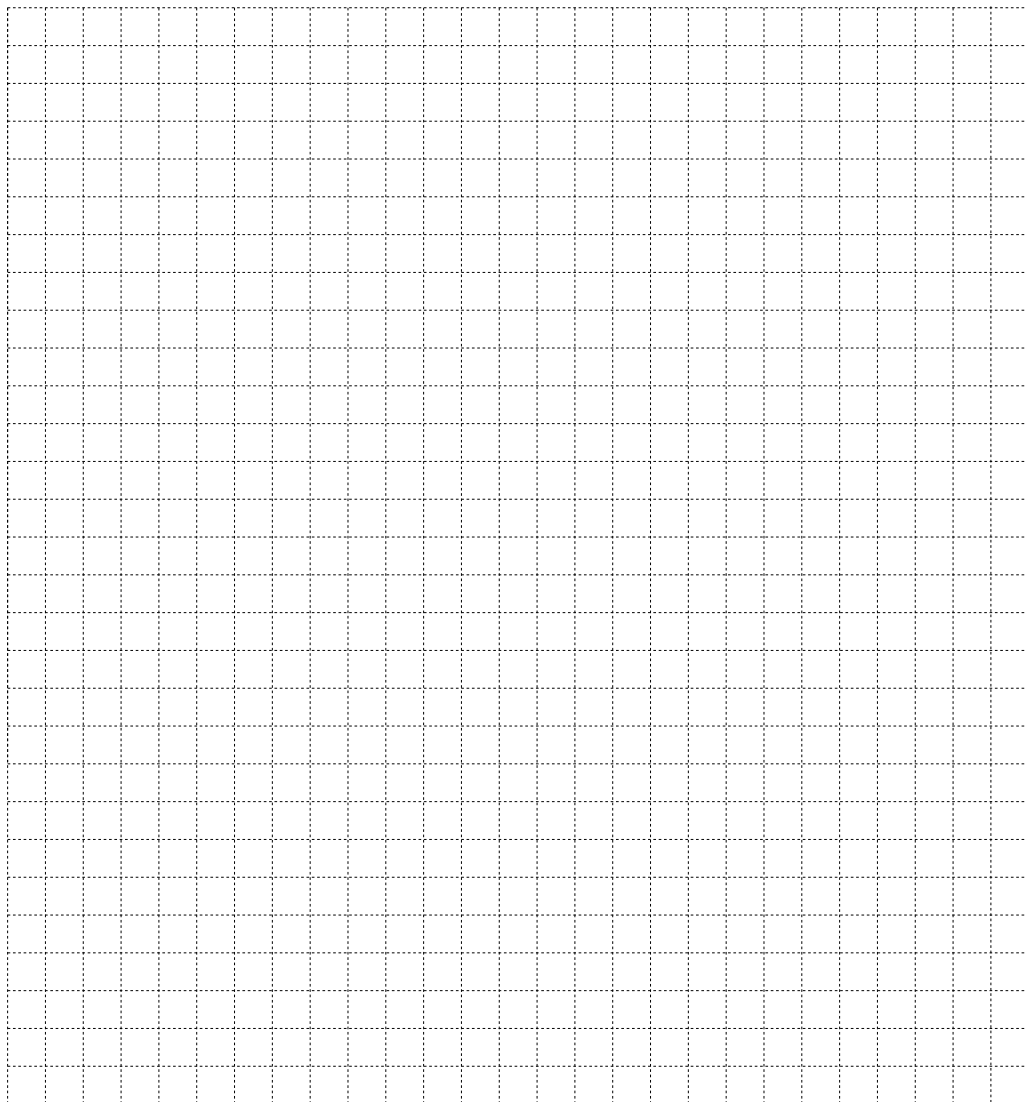
Algebra

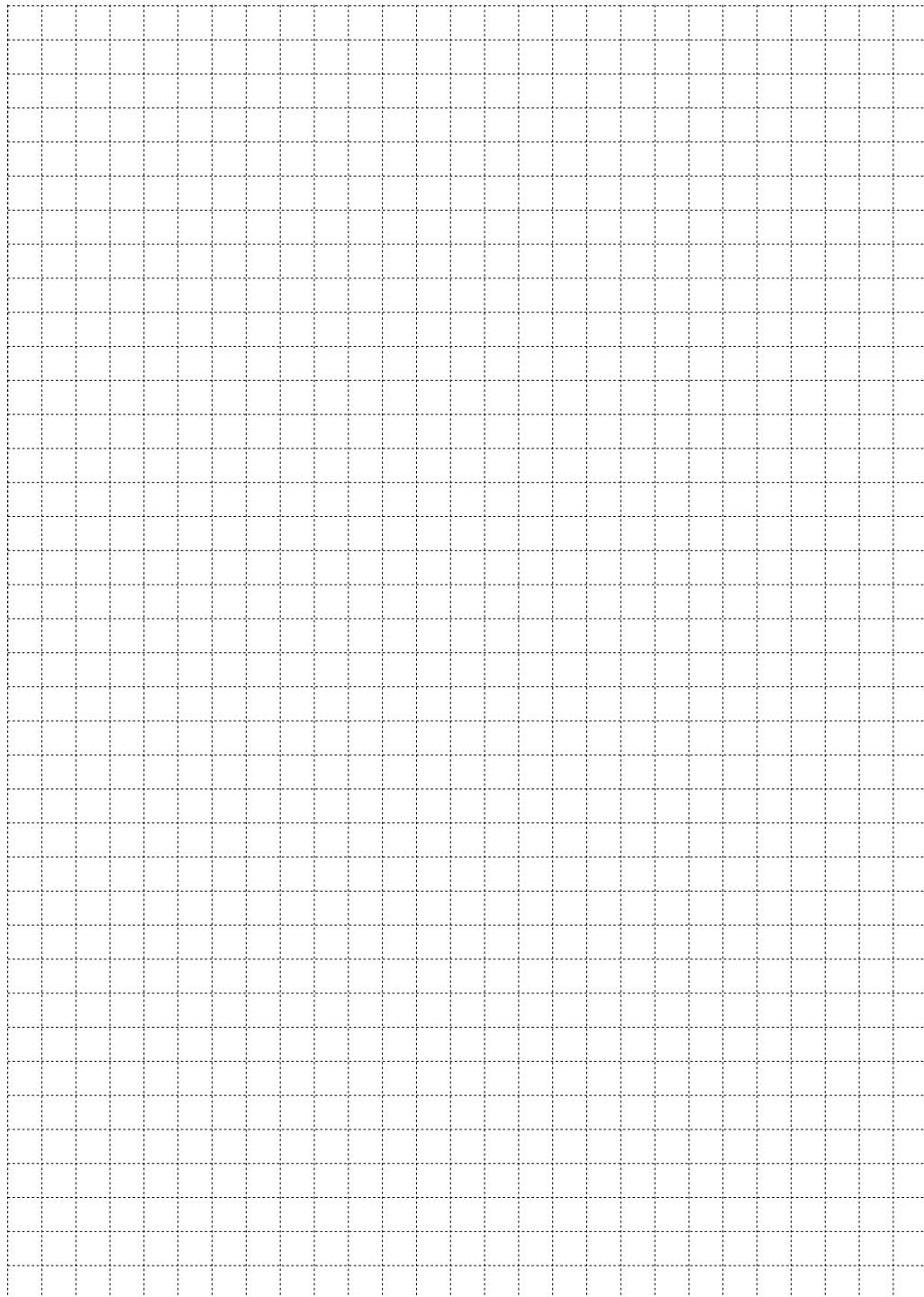
1. The function $f(x) = (x + 3)(x - 5)$ is given.
 - א. Find the points at which the graph of the function intersects the axes.
 - ב. Find the vertex of the parabola described by the function.
 - ג. Sketch the parabola described by the function.





2. The population of a certain country increases by 1.2% each year.
At the beginning of 1990, a census was conducted. The census found that there were 21.3 million people living in the country.
- א. What will the population of the country be at the start of the year 2020?
- ב. What was the size of the population at the start of 1980?





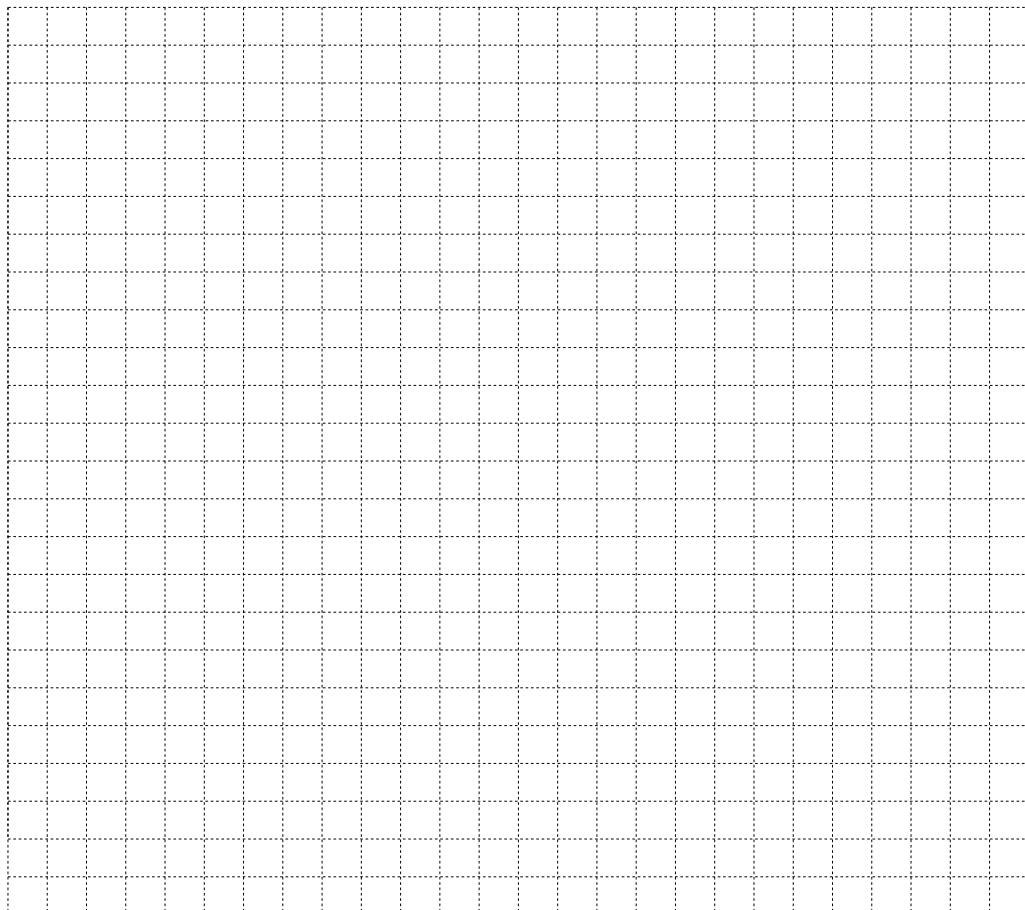
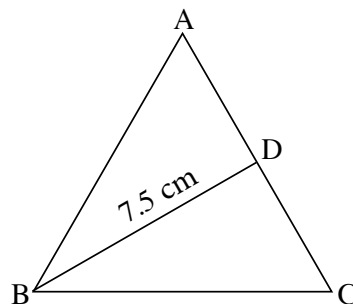
Trigonometry

3. The figure on the right shows the equilateral triangle [משולש שווה-צלעות] ABC .

BD is the median [תיכון] to Side AC .

Given: $BD = 7.5$ cm

- א. Calculate the length of a side of the triangle.
- ב. Calculate the perimeter of the triangle.
- ג. How long is a bisector [חוצה-הזווית] in this triangle? Explain.





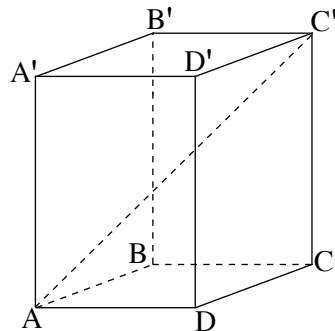
4. The rectangular cuboid [תיבה] ABCDA'B'C'D' is shown below.

Given: $AD = 15$ cm

$DC = 11$ cm

$CC' = 22$ cm

- א. Calculate the length of the diagonal of the base, AC.
- ב. Calculate the angle between the diagonal of the cuboid, AC', and the base ABCD.
- ג. Calculate the length of the diagonal of the cuboid.



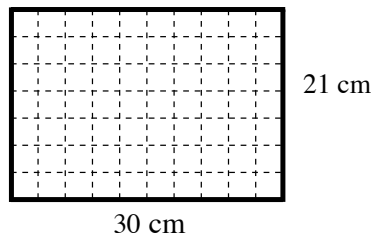


Statistics and Probability

5. The sides of a rectangular sheet of paper are 21 cm and 30 cm long.

Naama colored the edges of the paper black (see figure) and then cut the paper into equal squares whose sides were each 3 cm.

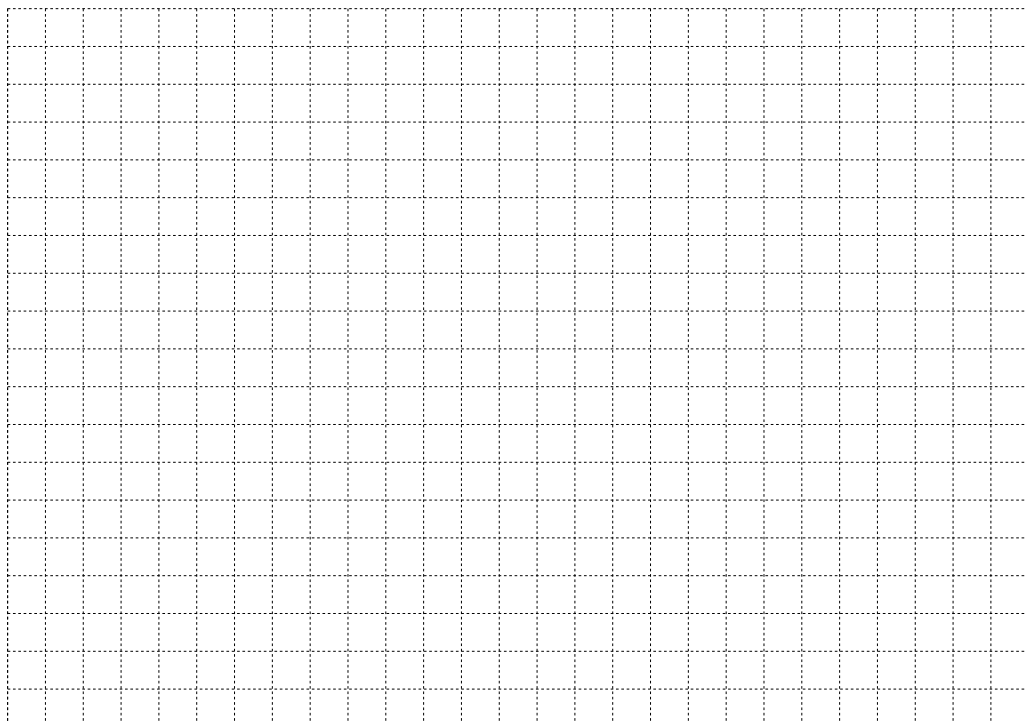
Naama thoroughly shuffled the squares that she had cut and gave them to her sister, Hila.



- א. Into how many squares did Naama cut the paper?

Hila selected a square at random.

- ב. What is the probability that exactly two of the sides of the square that she chose are colored black?
- ג. What is the probability that exactly one side of the chosen square is colored black?



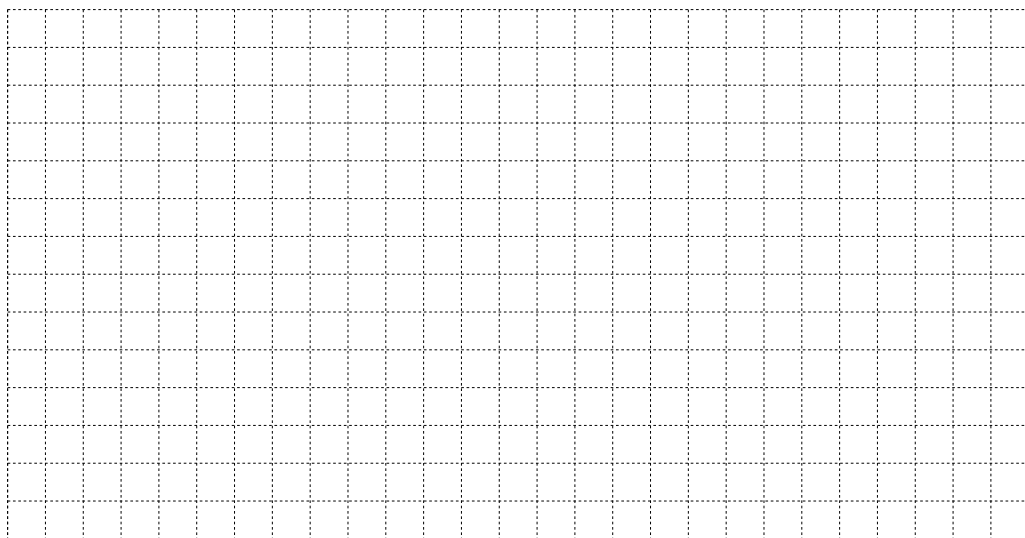
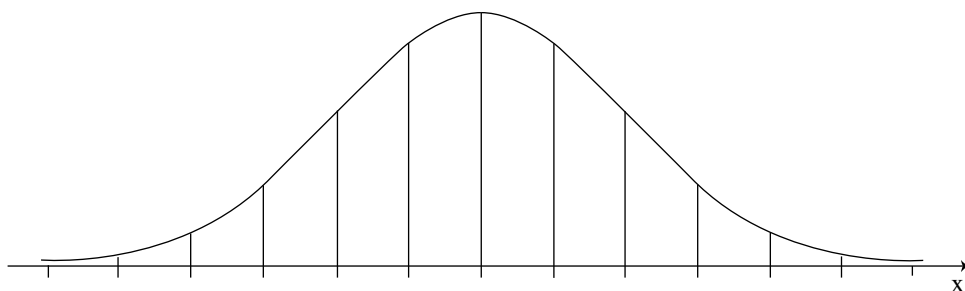


6. The daily milk production of cows has a normal distribution.

We know that 16% of the cows produce less than 20 liters of milk per day and that 2% of the cows produce less than 10 liters of milk per day.

- א. Calculate the average daily milk production and its standard deviation [סטיית התקן].
- ב. What percentage of the cows produce more than 30 liters of milk per day?

The outline of a graph of a normal distribution (from the formula sheet) is shown below. You may use this figure as you do your calculations.





Good Luck!

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בהצלחה!

זכות היוצרים שמורה למדינת ישראל
אין להעתיק או לפרסם אלא ברשות משרד החינוך

/Extra notebook pages are attached./

