

Mathematics

3 Points — Second Questionnaire

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 pages in the answer booklet (including those 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.

מ ת מ ט י ק ה

3 יחידות לימוד — שאלון שני

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) לטיוטה יש להשתמש בדפים שבגוף השאלון

(כולל הדפים שבסופו) או בדפים שקיבלת

מהמשיגים. שימוש בטיוטה 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.

Good Luck !

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בהצלחה!

/המשך מעבר לדף/

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 that you can earn is 100.

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

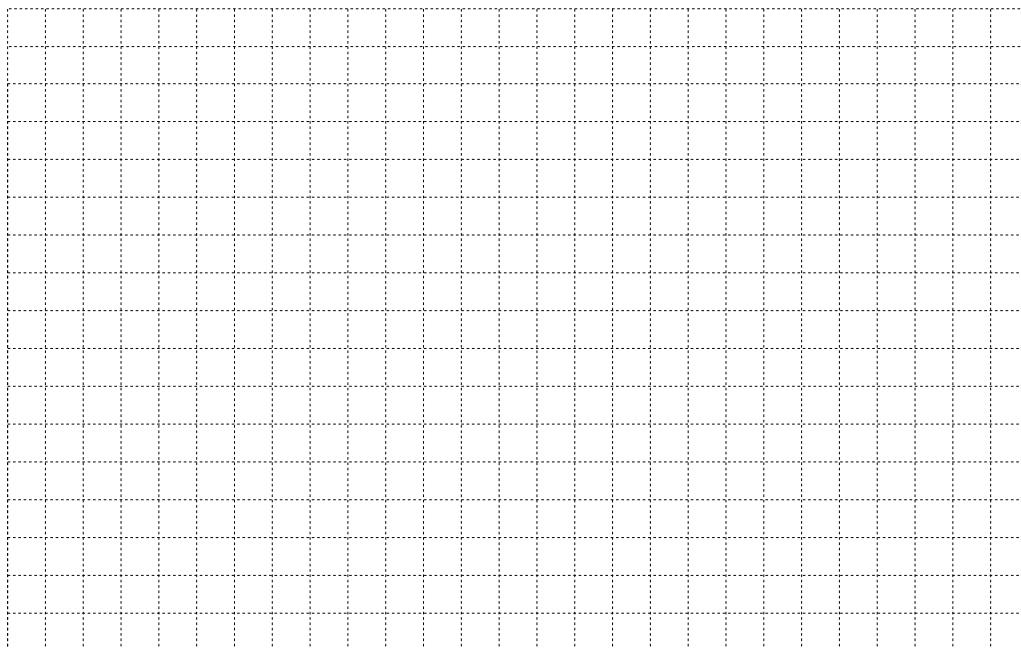
Note! Explain all of your work, including calculations, clearly and in detail.

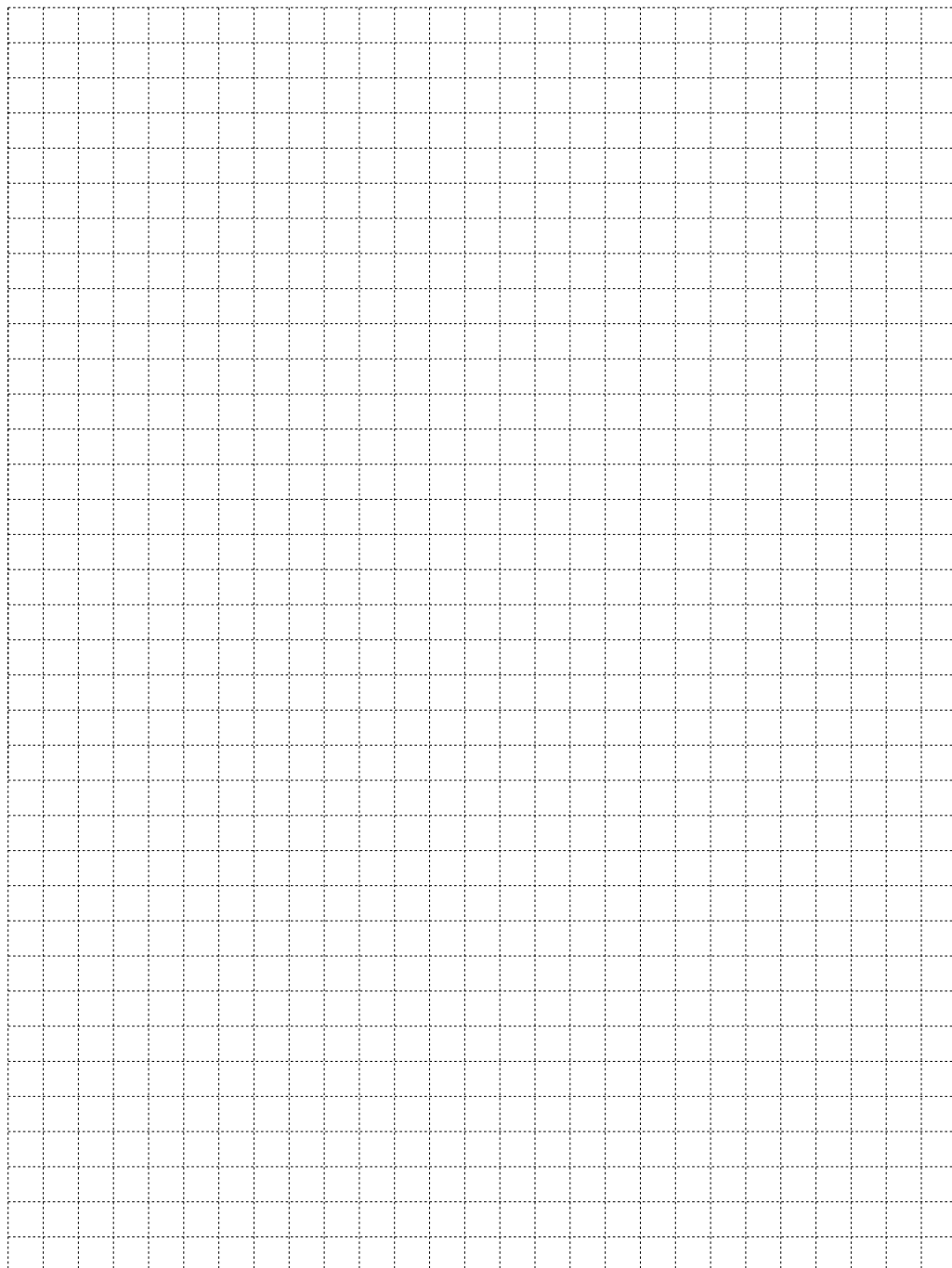
Lack of detail may lower your score or lead to the disqualification of the exam.

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. An electrical appliance was paid for in 12 installments [תשלומים] that together constitute an increasing arithmetic sequence.

The eighth payment is 581 shekels more than the first payment.

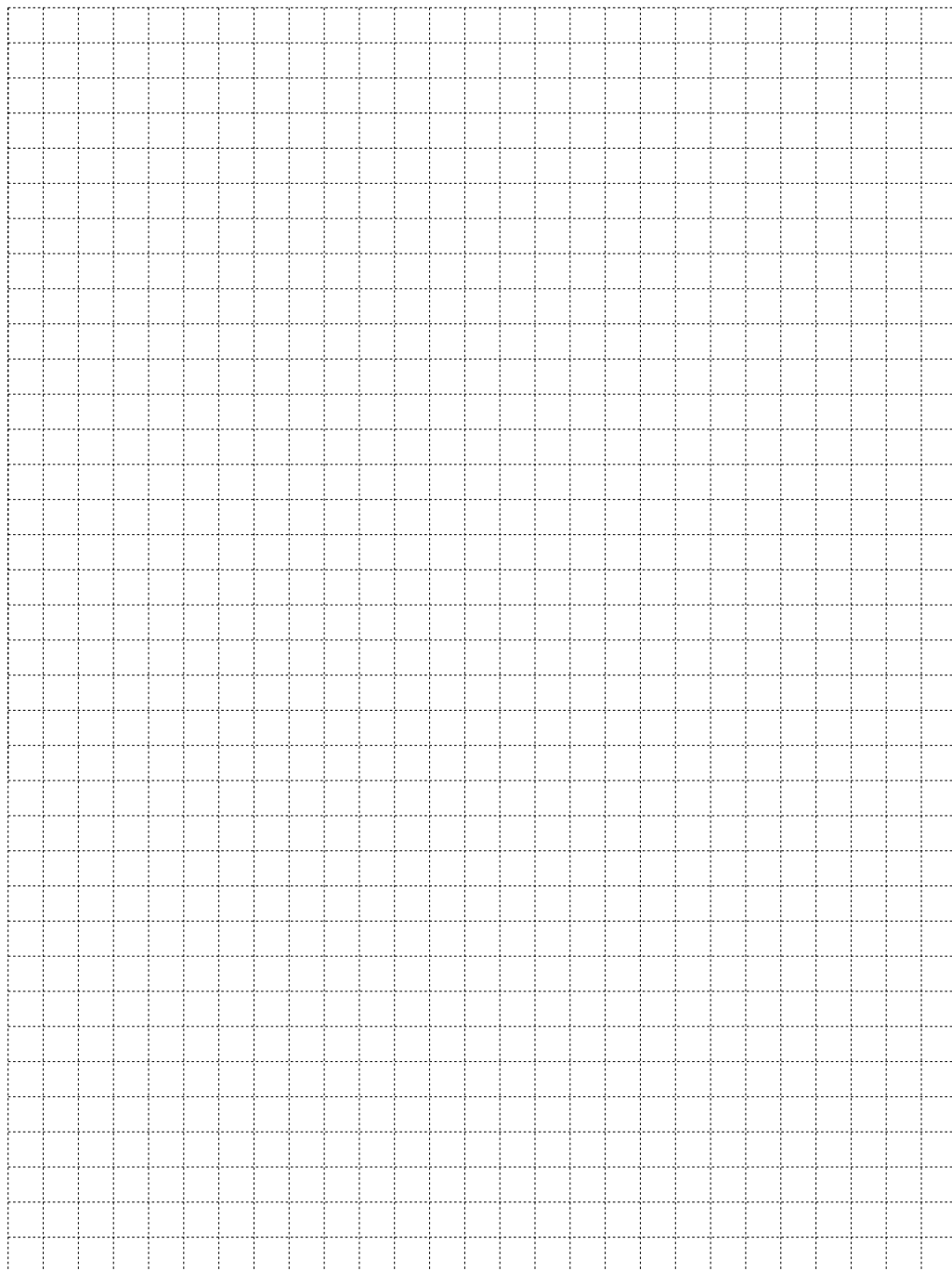
The sum of the sixth and seventh payments is 1743 shekels.

א. (1) What is the difference between two consecutive payments?

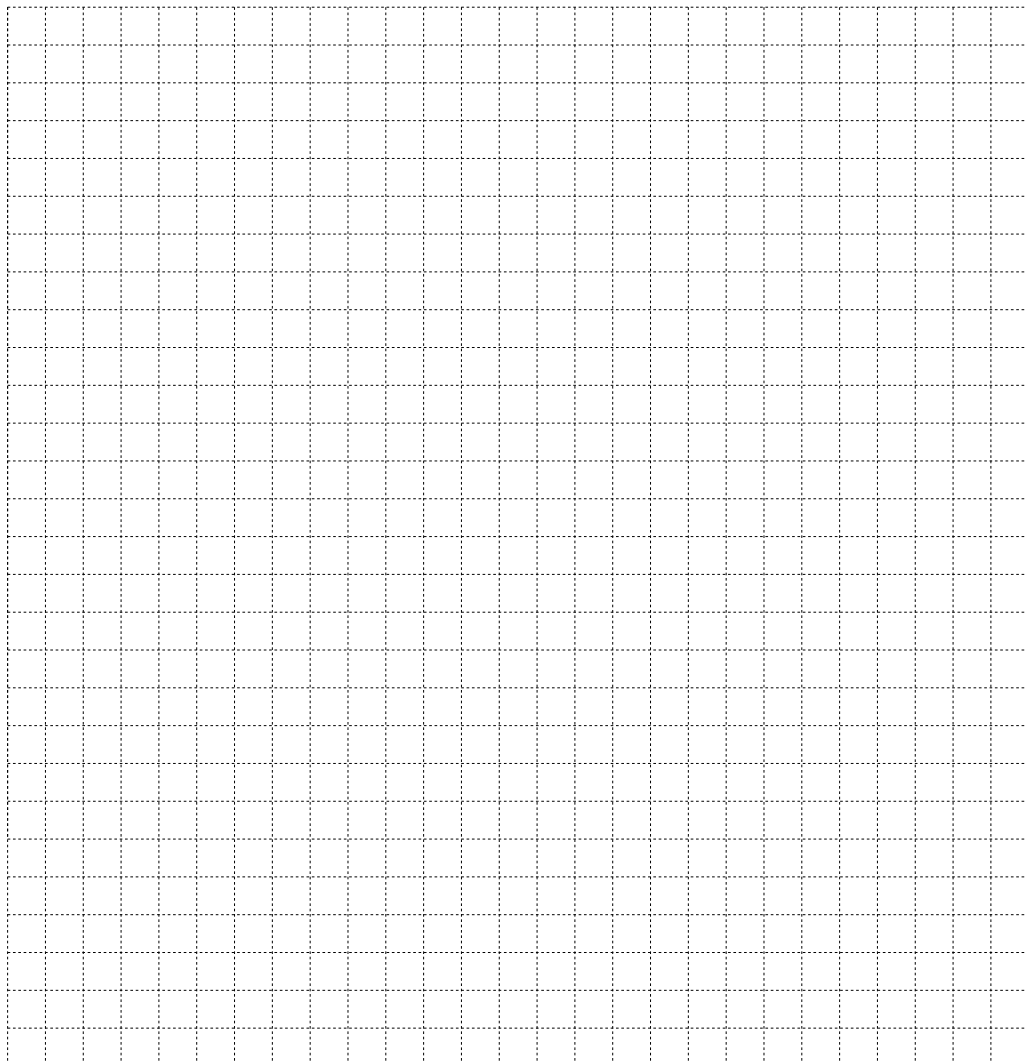
(2) What was the first payment?

ב. Determine the price of the appliance.





3. 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

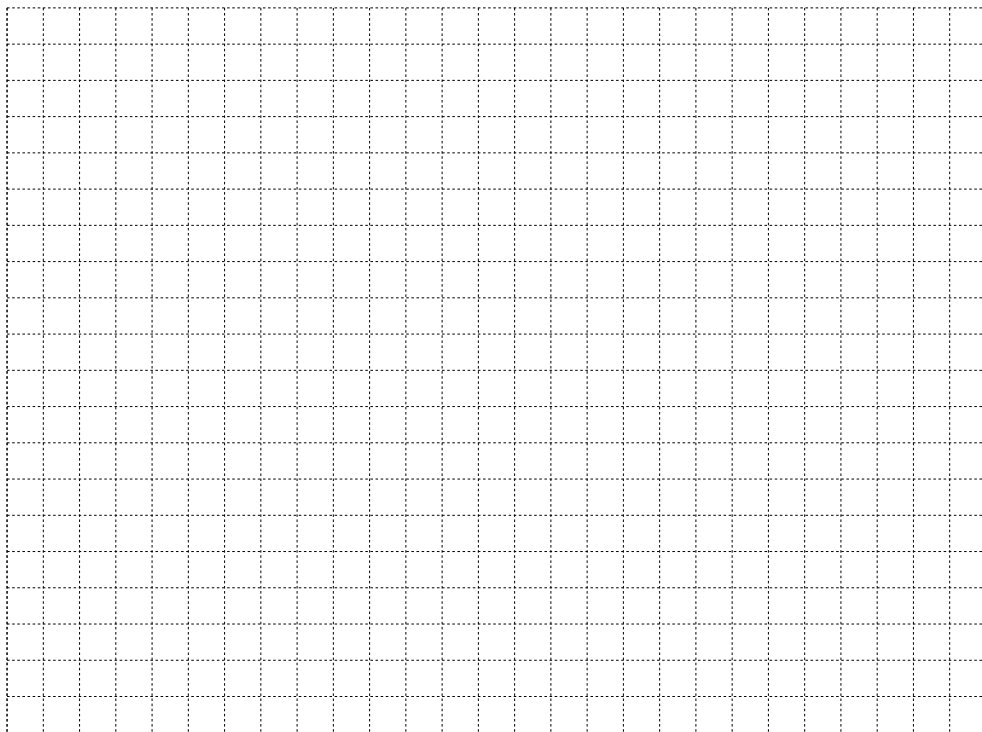
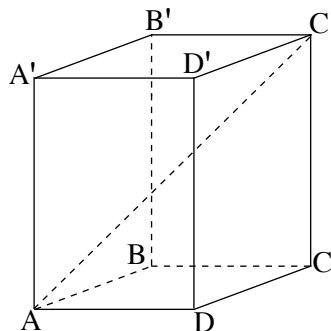
4. The rectangular cuboid $ABCD A'B'C'D'$ is shown below.

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. A certain class needs to choose a representative for the school's Student Council.

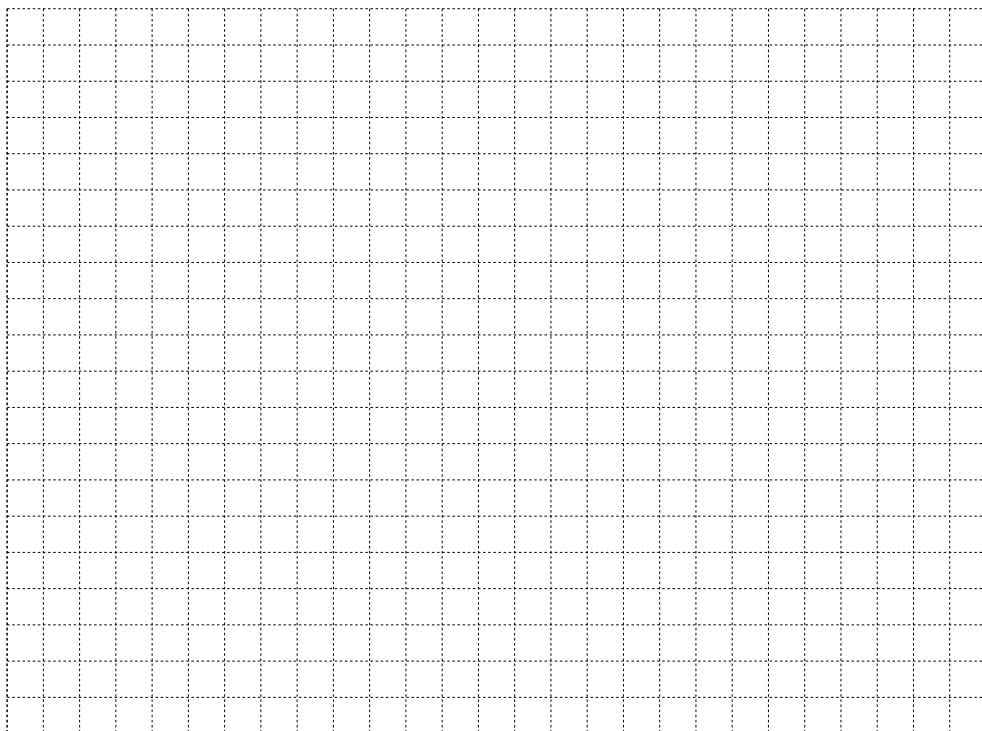
Three girls and five boys are running for the office.

The representative will be chosen based on a coin toss.

If the result is "heads" [תמונה], one of the boys will be chosen at random.

If the result is "tails" [מספר], one of the girls will be chosen at random.

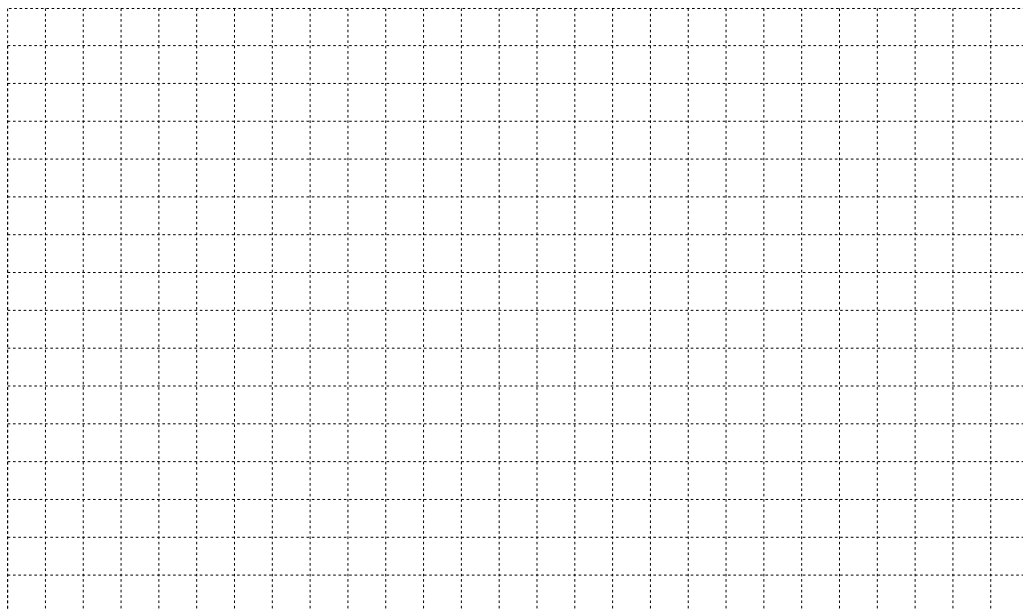
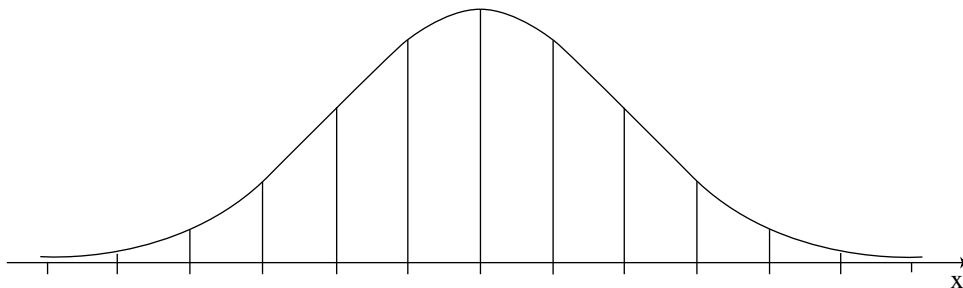
- א. Asaf is one of the boys running for office. What is the probability that Asaf will be chosen? Explain.
- ב. Hila is one of the girls running for office. What is the probability that Hila will be chosen? Explain.





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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/Extra notebook pages are attached./

בהצלחה!

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



