The State of Israel
Ministry of Education
Exam Type: *Bagrut*
Exam Date: Summer 2026
Exam Number: 35372
Appendix: Formula sheets for 3 points
English Translation (3)

מדינת ישראל
משרד החינוך
סוג הבחינה: בגרות
מועד הבחינה: קיץ תשפ"ו, 2026
מספר השאלון: 35372
נספח: דפי נוסחאות ל־3 יחידות לימוד
תרגום לאנגלית (3)

תוכנית חדשה

Mathematics

3 Points — 3rd Exam

מ ת מ ט י ק ה

3 יחידות לימוד – שאלון שלישי

Instructions

א. Duration of the exam: Two and a quarter hours.

ב. Exam structure and breakdown of points:
This exam has two parts, with a total of six questions.
You must answer four questions, at least one question from each part. Each question is worth 27 points.
You can earn a maximum of 100 points in total.

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 your exam.
(2) Formula sheets (attached).
(3) A Hebrew–foreign language / foreign language–Hebrew dictionary.

ד. Special instructions:
(1) **Write all your calculations and answers in the Hebrew exam booklet.**
Do not write in the margins.
(2) 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 your exam.
(3) Use the pages in the **Hebrew exam booklet** for draft work. If you use other paper for draft work, your exam may be disqualified.

Note: There is draft paper at the end of the Hebrew exam booklet. Do not add any other paper to the exam booklet.

הוראות

א. משך הבחינה: שעתיים ורבע.

ב. מבנה השאלון ומפתח ההערכה:
בשאלון זה שני פרקים, ובהם שש שאלות סך הכול.
יש לענות על ארבע שאלות, על שאלה אחת לפחות מכל פרק – לכל שאלה 27 נקודות.
סך הכול – 100 נקודות לכל היותר.

ג. חומר עזר מותר בשימוש:
(1) מחשבון לא גרפי.
אין להשתמש באפשרויות התכנות במחשבון שיש בו אפשרות תכנות.
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) **כתבו את כל החישובים והתשובות בנוסח העברי של השאלון.**
אסור לכתוב על הפסים שבשוליים.
(2) יש להסביר את כל הפעולות, כולל חישובים, בפירוט ובצורה ברורה ומסודרת. חוסר פירוט עלול לגרום לפגיעה בציון או לפסילת הבחינה.
(3) לטיוטה יש להשתמש **בדפים שבנוסח העברי של השאלון**. שימוש בטיוטה אחרת עלול לגרום לפסילת הבחינה.

שימו לב: בסוף הבחינה בעברית מצורפים דפי טיוטה. אין להוסיף דפים אחרים למחברת הבחינה.

Good Luck!

בהצלחה!

(Continued on page 2)

Questions

Answer four of the questions 1–6, at least one question from each part (each question – 27 points).

Note: If you answer more than four questions, only the first four answers in your answer booklet will be graded.

Write all your calculations and answers in the Hebrew exam booklet.

Part One – Linear Programming, Analytical Geometry

Finance and Economics

1. A restaurant serves two types of dishes every day – a vegetarian dish and a meat dish.

Let x denote the number of vegetarian dishes and let y denote the number of meat dishes served in the restaurant in one day.

Below is the system of constraints [מערכת האילוצים] for preparing dishes at this restaurant in one day.

$$x \geq 0$$

$$y \geq 0$$

$$x + 5y \leq 100$$

$$x + 2y \leq 58$$

א. Sketch the feasible region [התחום האפשרי] obtained from the given system of constraints.

The restaurant's profit from selling one vegetarian dish is 25 shekels, and the profit from selling one meat dish is 55 shekels.

ב. **(1)** Write the objective function [פונקציית המטרה] for the restaurant's profit from selling the dishes.

(2) How many dishes of each type should the restaurant sell in one day for a maximum profit?

The restaurant manager decided to change the dishes' prices.

As a result, the profit from selling one vegetarian dish decreased by 10%, and the profit from selling one meat dish increased by 20%.

ג. **(1)** Find the profit from selling one vegetarian dish and the profit from selling one meat dish after the change in prices.

(2) Find by how much the restaurant's maximum profit increased in one day after the change in prices.

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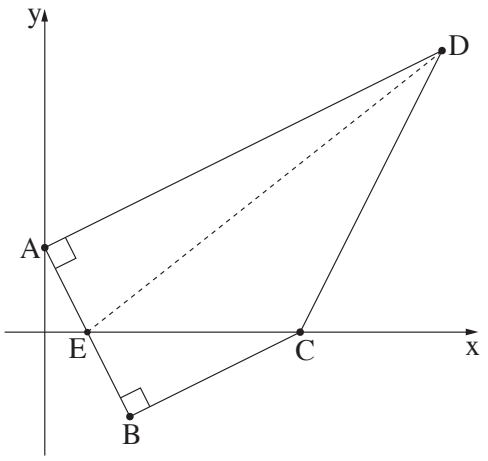
2. ABCD is a right trapezoid ($\sphericalangle ABC = 90^o$, $AD \parallel BC$).
Point E is the midpoint of Side AB (see figure).
We know the points $A(0\,,6)$, $E(3\,,0)$.



א. Find the coordinates of Vertex B .

ב. **(1)** Find the slope of Side AB .

(2) Find the equation of Side BC .

Vertex C is located on the x-axis.

ג. Find the coordinates of Vertex C .

Below are four equations I–IV .

I. $y = 0.5x + 3$ **II.** $y = 0.5x + 6$ **III.** $y = 2x - 36$ **IV.** $y = 2x - 30$

One of the equations corresponds to Line AD , and one of the equations corresponds to Line CD .

ד. Determine which equation corresponds to Line AD , and which equation corresponds to Line CD .
Explain your answers.

ה. **(1)** Find the coordinates of Vertex D .

(2) Find the area of Triangle ECD .

(Continued on page 4)

Part Two – Normal Distribution, Quadratic Model, Spatial Perception, Spatial Geometry

Society and Science

3. In a certain month, the electricity bills of the apartments in a neighborhood are normally distributed, and have a standard deviation of 160 shekels.

The electricity bills of 16% of the apartments in the neighborhood were lower than 400 shekels in this month.

א. Find the average electricity bill.

ב. A normal distribution curve is printed at the end of the question here, and in the Hebrew exam booklet.

Fill in the empty boxes in the **Hebrew exam booklet** with the values of the electricity bills of the apartments in the neighborhood.

The electricity bills of 1,232 of the apartments in the neighborhood were higher than 400 shekels and lower than 800 shekels.

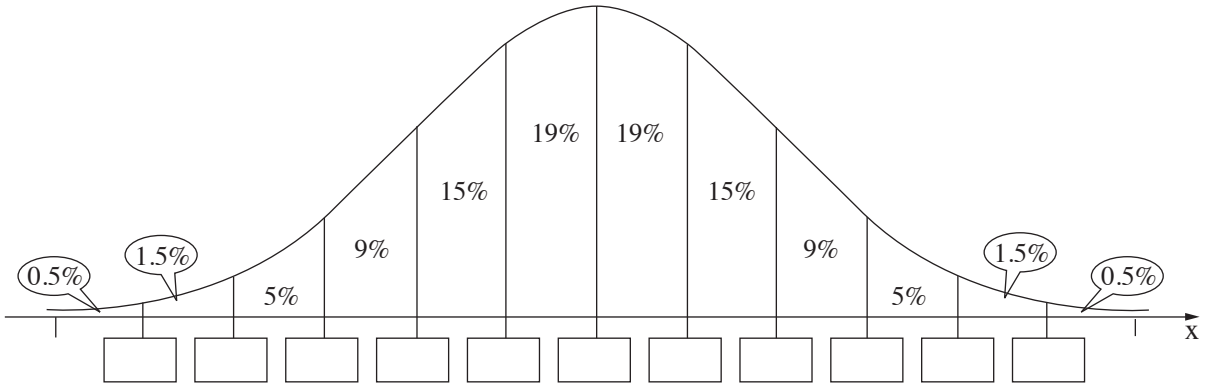
ג. **(1)** Find the percentage of apartments in the neighborhood whose electricity bills were higher than 400 shekels and lower than 800 shekels.

(2) Based on the normal distribution curve, how many apartments are there in the neighborhood?

Apartments whose monthly electricity bills are higher than 900 shekels receive a warning notice from the electric company.

The standard score [ציון התקן] of the electricity bill of one of the apartments in the neighborhood this month was 2.3 .

ד. Did this apartment receive a warning notice from the electric company? Explain your answer.



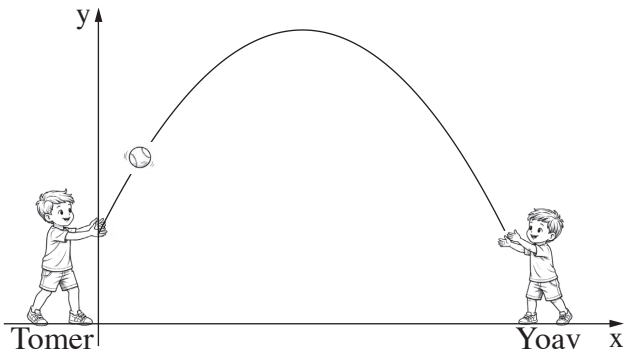
(Continued on page 5)

4. Tomer and Yoav played catch with a small ball on a level field.

In one of the passes, Tomer threw the ball to Yoav. The ball travelled on a path shaped like a parabola whose equation is $y = -0.4x^2 + 2x + 1.1$, as shown in the figure.

The x-axis describes the horizontal distance (in meters) of the ball from the point from which it was thrown.

The y-axis describes the height of the ball above the ground (in meters).



א. Find the maximum height that the ball reached.

ב. Find for which values of x the ball was in an upward trend.

Yoav caught the ball at a point whose x-coordinate is 5.2 meters.

ג. Find the ball's height above the ground when Yoav caught it.

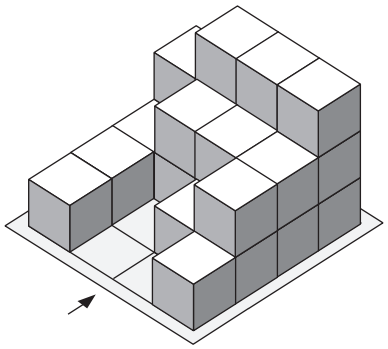
ד. What is the x-coordinate of the point where the ball would have hit the ground if Yoav had not caught the ball or touched it?

(Continued on page 6)

Planar and Spatial Orientation

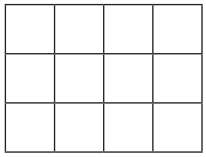
5. The figure below shows a structure built of identical cubes. The arrow in the figure indicates the front view.

Each cube rests either on the surface or on another cube.

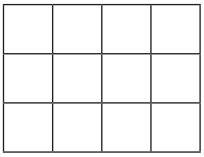


א. Templates for the front view and right side view of the structure are printed below, and in the Hebrew exam booklet.

Fill in the front view and the right side view of the structure using the templates in the **Hebrew exam booklet**.



Front view



Right side view

ב. Draw a number chart [תרשים מספרים] for the structure.

One cube was added to the structure such that the front view was identical to the rear view.

ג. Draw a number chart for the structure, after the addition of the cube.

The added cube was removed from the structure.

Next, several additional cubes were removed from the structure.

Below, is the new number chart for the structure, after all the cubes were removed.

2	3	3	2
1	2	1	1
1		1	2
1			1

ד. **(1)** How many additional cubes were removed from the structure?

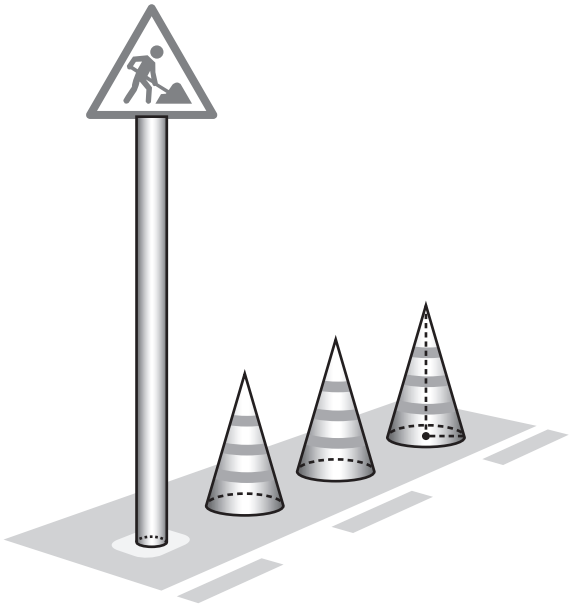
(2) Which view changed after removing these cubes – the front view, right side view, left side view, or top view?

(Continued on page 7)

6. A municipality blocked one of the lanes on a road due to road work.

For safety reasons, workers placed a warning sign and three identical cones (see figure).

We know that the length of the base radius of each cone is 21 cm, and that the height of each one is 72 cm.



א. Find the length of the slant height [הקו היוצר] of each of the cones.

ב. Find the total lateral surface area [שטח המעטפת] of all three cones.

The pole holding the warning sign is in the shape of a cylinder.

We know that the pole's height is 3 times the height of a cone, and that its volume is $3{,}456\pi$ cm^3 .

ג. Find the length of the pole's base radius.

ד. Is the pole's lateral surface area greater or smaller than the total lateral surface area of the three cones? Explain your answer.

Good Luck!

בהצלחה!