

Mathematics

3 Points — First 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 Hebrew test booklet.**

Do not write in the shaded 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 the exam.

(3) For draft paper, use pages in the **Hebrew test
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.

Good Luck!

מ ת מ ט י ק ה

3 יחידות לימוד - שאלון ראשון

הוראות לנבחן

א. משך הבחינה: שעה וחצי.

ב. מבנה השאלון ומפתח ההערכה:

בשאלון זה שש שאלות.

לכל שאלה — 25 נקודות.

מוותר 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 בנוסח העברי
של השאלון.**

אסור לכתוב על הפסים שבשוליים.

(2) הסבר את כל פעולותיך, כולל חישובים, בפירוט
ובצורה ברורה ומסודרת.
חוסר פירוט עלול לגרום לפגיעה בציון או לפסילת
הבחינה.

(3) לטיוטה יש להשתמש בדפים שבנוסח העברי של
השאלון (כולל הדפים שבסופו) או בדפים שקיבלת
מהמשגיחים. שימוש בטיוטה אחרת עלול לגרום
לפסילת הבחינה.

בהצלחה!

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.

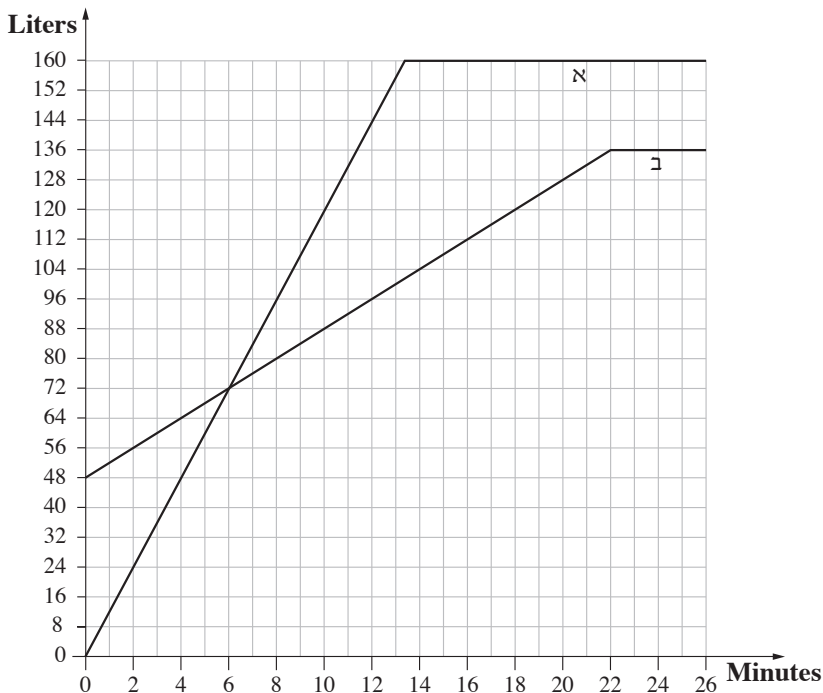
Write all of your calculations and answers in the test booklet.

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 price of 1 table and 4 chairs is 1800 shekels.
The price of 2 tables and 6 chairs is 3200 shekels.
 - א. Calculate the price of a table and the price of a chair.
 - ב. How much would 4 chairs cost if the price of 1 chair increased by 15%?

2. Given: two containers, Container א and Container ב.
Container א is empty and there are 48 liters of water in Container ב.
At a certain moment, two faucets are turned on and water flows into the two containers until the containers are full.
The two graphs below, א and ב, depict the quantity of water in each container as a function of time (from the moment that the faucets were turned on).



Study the graphs and answer the items below.

- א. How many liters of water did each container contain 8 minutes after the faucets were turned on?
- ב. (1) How many minutes after the faucets were turned on did Container א contain 120 liters of water?
(2) How many minutes after the faucets were turned on did Container ב contain 120 liters of water?
- ג. After the faucets were turned on, for how long (in minutes) did Container ב contain more water than Container א?
- ד. 10 minutes after the faucets were turned on, which container contained more water than the other and by how many liters?
- ה. How many minutes after the faucets were turned on did Container ב become full?

3. In an arithmetic sequence, the third term [איבר] is 5 and the fifth term is 11.

- א. Find the common difference of the sequence [הפרש הסדרה].
- ב. Find the first term of the sequence.
- ג. Find the sum of the first 15 terms of the sequence.

4. Given: Quadrilateral ABCD (see figure)

Two of the quadrilateral's vertices are:

A(0,0) and C(11,11).

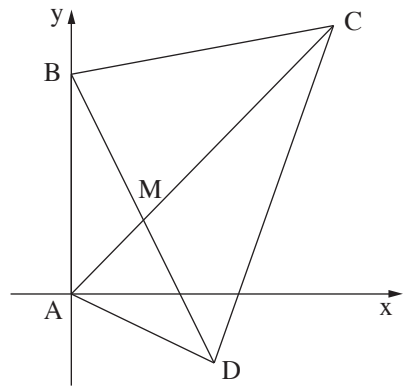
Vertex B lies on the y-axis.

The x-coordinate of Vertex D is 6.

The equation of the diagonal BD is

$$y = -2x + 9.$$

- א. Find the coordinates of Vertex B and the y-coordinate of Vertex D.
- ב. Find the equation of the diagonal AC.
- ג. The diagonals of the quadrilateral intersect at Point M.
Find the coordinates of Point M.
- ד. Find the length of the segment BM.



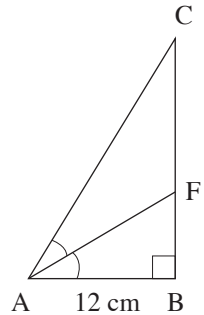
Trigonometry

5. In the right triangle ABC ($\angle ABC = 90^\circ$),

AF bisects CAB (see figure).

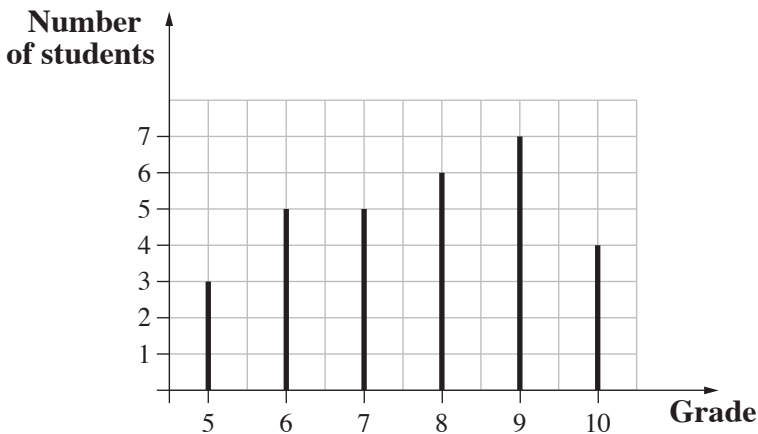
Given: $\angle CAB = 64^\circ$, $AB = 12$ cm.

- א. Calculate the length of the hypotenuse [יתר] AC.
- ב. Calculate the length of the segment BF.
- ג. Calculate the length of the segment FC.



Statistics and Probability

6. Below is a bar graph depicting the distribution of grades in Tanach in a certain class.



- א. How many students are there in the class?
- ב. What is the average Tanach grade in the class?
- ג. What is the modal grade [הציון השכיח]?

One of the students in the class is chosen at random.

- ד. What is the probability that his grade is between 7 and 9 (inclusive)?
- ה. What is the probability that his grade is below the class average?

Good Luck!

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בהצלחה!

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