

Mathematics

3 Points — 2nd Exam

מ ת מ ט י ק ה

3 יחידות לימוד - שאלון שני

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 your 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 your exam.
- (3) For draft paper, use pages in the **Hebrew test booklet** (including those at the end of the booklet). Use of other draft paper may lead to the disqualification of your exam.

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 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) לטיטה יש להשתמש בדפים שבנוסח העברי של השאלון

(כולל הדפים שבסופו).

שימוש בטיטה אחרת עלול לגרום לפסילת הבחינה.

Good Luck!

בהצלחה!

Questions

This exam consists of 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 Hebrew exam 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

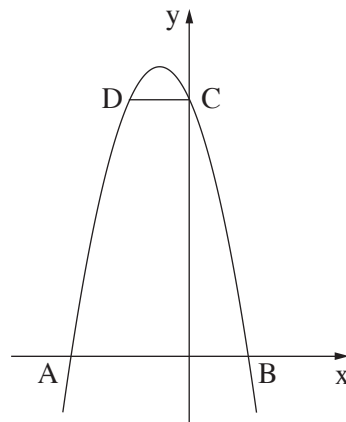
1. The figure to the right shows the graph of the function $f(x) = -x^2 - 3x + 18$.

A and B are the points of intersection of the graph of the function $f(x)$ with the x -axis, as shown in the figure.

C is the point of intersection of the graph of the function $f(x)$ with the y -axis.

Point D is a point on the graph of the function $f(x)$, such that the segment DC is parallel to the x -axis.

- א. Find the coordinates of Points A, B, C, and D.
- ב. Calculate the area of the triangle ABC.
- ג. Calculate the area of the trapezoid ABCD.



2. On January 1, 2018 Yael had 30,870 shekels in her savings account.
Her savings account makes a 5% profit every year.
- א. How much money will Yael have in her savings account on January 1, 2030?
 - ב. Yael started her savings account on January 1, 2016.
Find what her initial investment was.
 - ג. On January 1 of which year will Yael have more than 35,000 shekels in her savings account for the first time?

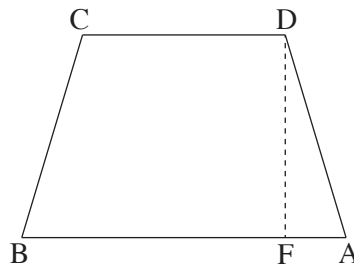
Trigonometry

3. ABCD is an isosceles trapezoid ($BA \parallel CD$). DF is a height of this trapezoid (see figure).

Given: $CD = 15$ cm, $BA = 24$ cm,

the angle BAD is 71° .

- א. Calculate the length of the segment AF.
- ב. Calculate the length of the leg AD.
- ג. Calculate the size of the angle DBF.

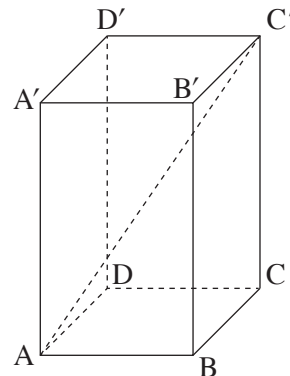


4. Given: the cuboid $ABCD A' B' C' D'$ whose base, $ABCD$, is a rectangle (see figure).

Given: $AB = 12$ cm, $BC = 9$ cm,

The angle between the diagonal of the cuboid AC' and
 the base of the cuboid, $ABCD$, is 58° .

- א. Calculate the length of the base diagonal.
- ב. Calculate the length of the cuboid's edge CC' .
- ג. Calculate the lateral surface area [שטח המעטפת] of the cuboid.



Probability and Statistics

5. Given: two fortune wheels — Wheel א and Wheel ב (see figure).

Wheel א is divided into three equal sectors on which are written the numbers 1, 2, and 3.

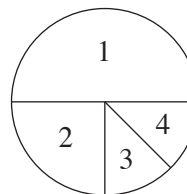
Wheel ב is divided into four sectors:

a sector that is $\frac{1}{2}$ of the circle and has the number 1 on it,

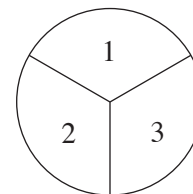
a sector that is $\frac{1}{4}$ of the circle and has the number 2 on it,

a sector that is $\frac{1}{8}$ of the circle and has the number 3 on it,

and another sector that is $\frac{1}{8}$ of the circle and has the number 4 on it.



Wheel ב



Wheel א

Each wheel is turned once.

- א. What is the probability that both Wheel א and Wheel ב will stop on the number 3?
- ב. What is the probability that the sum of the numbers from both wheels when they have stopped will be 5?
- ג. What is the probability that the number Wheel א stops on will be greater than the number Wheel ב stops on?

6. In a national examination, student scores have a normal distribution.

The standard deviation of student scores is 8.

16% of the scores are higher than 80.

א. What is the average student score?

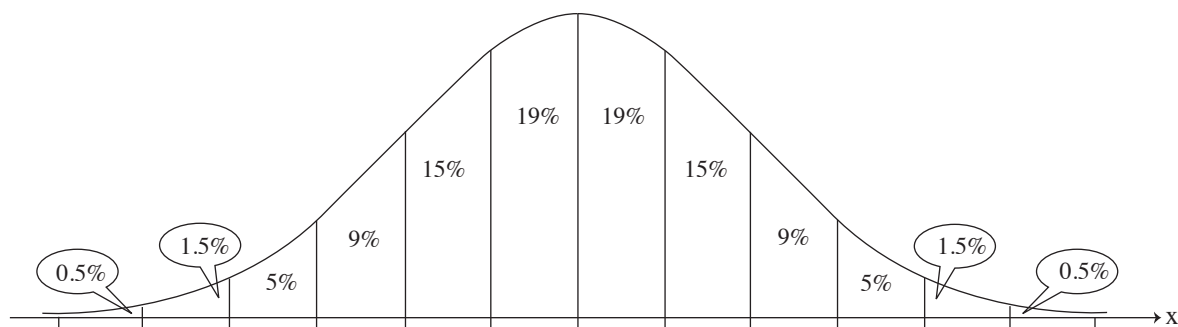
ב. An examinee is selected at random. What is the probability that this examinee's score is lower than 56?

ג. It was decided that students with the highest scores would be awarded a certificate of excellence.

Students who received a certificate of excellence make up 7% of all examinees.

Dvir's score was 83. Did he receive a certificate of excellence? Explain.

Below is the normal distribution graph from the formula sheet. Use it in your calculations.



Good Luck!

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בהצלחה!

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