

Mathematics

3 Points — 1st Exam

מתמטיקה

3 יחידות לימוד — שאלון ראשון

Instructions for examinees

הוראות לנבחן

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

א. משך הבחינה: שעה וחצי.

ב. Exam structure and breakdown of points:

ב. מבנה השאלון ומפתח ההערכה:

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.

בשאלון זה שש שאלות.
כל שאלה — 25 נקודות.
מותר לך לענות על מספר שאלות כרצונך,
אך סך הנקודות שתוכל לצבור לא יעלה על 100.

ג. Material that may be used during the exam:

ג. חומר עזר מותר בשימוש:

- (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.

- (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. Special instructions:

ד. הוראות מיוחדות:

- (1) Write all of your calculations and answers in the Hebrew exam 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 exam booklet** (including those at the end of the booklet).
Use of other draft paper may lead to the disqualification of your exam.

- (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.
חסר פירוט עלול לגרום לפגיעה בציון או לפסילת הבחינה.
- (3) לטייטה יש להשתמש בדפים שבנוסח העברי של השאלון (כולל הדפים שבסופו).
שימוש בטייטה אחרת עלול לגרום לפסילת הבחינה.

Good Luck!

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 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

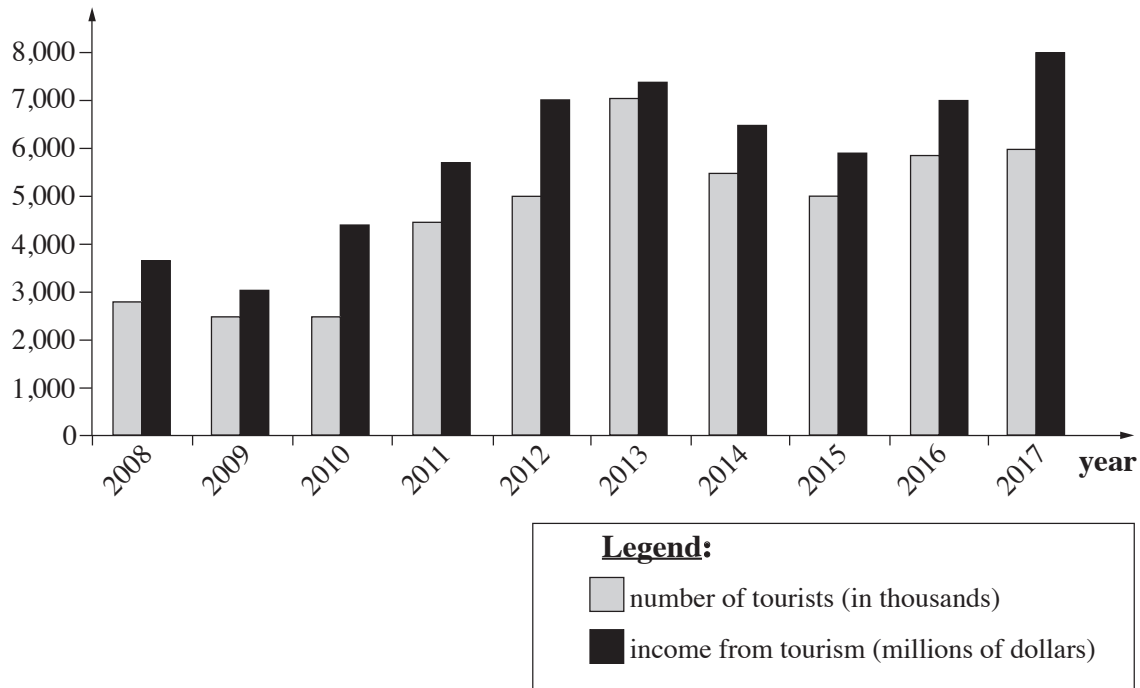
1. א. Orit bought a book whose price was 80 shekels, and she was given a 25% discount on the book.

How many shekels did Orit pay for the book?

- ב. The price of a booklet was x shekels. The price was reduced by 21 shekels, which was a 25% discount on the original price.

What was the price of the booklet before the reduction?

2. The graph below shows the number of tourists who entered a certain country and the income this country earned from tourism in each of the years 2008-2017.



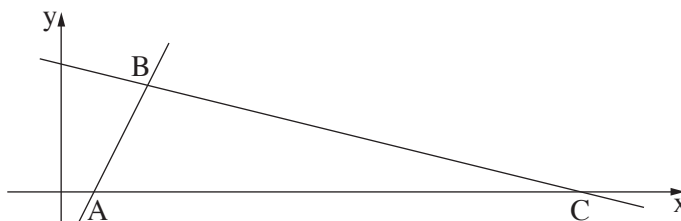
- א. In which year was the number of tourists entering the country largest?
- ב. In which year was the income from tourism the highest?
- ג. In which years did fewer than four million tourists enter the country?
- ד. In which years was the income from tourism lower than 4,000,000,000 dollars?
- ה. In 2017, how many dollars on average did the country earn from each tourist? Explain.

3. An arithmetic sequence contains 16 terms. The third term of the sequence is 17, and the common difference [הפרש] of the sequence is 4.

- א. Find the 11th term of the sequence.
- ב. Find the last term of the sequence.
- ג. Find the sum of the last 6 terms of the sequence.

4. The line whose equation is $y = 2x - 3$ and the line whose equation is $y = -\frac{1}{4}x + 6$, together with the x-axis, form Triangle ABC (see figure).

- א. Find the coordinates of Vertices A, B, and C.
- ב. Find the length of Side AC.
- ג. Calculate the area of Triangle ABC.



Trigonometry

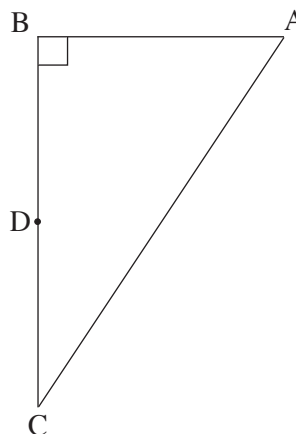
5. ABC is a right triangle ($\angle ABC = 90^\circ$).

Given: $AB = 4$, $AC = \sqrt{52}$.

- א. Find the length of Side BC.

Given: Point D is the midpoint of Side BC.

- ב. What is the length of Segment BD?
- ג. Calculate the size of Angle BAD.
- ד. Calculate the size of Angle DAC.



Probability and Statistics

6. The inhabitants of a remote island were offered the opportunity to be vaccinated against a local disease. Only people who wished to be vaccinated received the vaccine. One year after the vaccine was administered, a study was made to determine which of the inhabitants had become sick with this disease.

The results are shown in the table below.

	Vaccinated	Not vaccinated
Became sick with the local disease	200	300
Did not become sick with the local disease	800	600

- א. How many people in total inhabit the island?

One of the inhabitants of the island was chosen at random.

- ב. What is the probability that he became sick with the local disease?
- ג. What is the probability that he was vaccinated that year against the local disease?
- ד. One of the vaccinated inhabitants was chosen at random. What is the probability that he became sick with the local disease?

Good Luck!

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בהצלחה!

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