The State of Israel
Ministry of Education
Exam Type: *Bagrut*
Exam Date: Summer 2017, ***Moed Bet***
Exam Number: 035182
Appendix: Formula sheets for 3 points
English Translation (3)

מדינת ישראל
משרד החינוך
סוג הבחינה: בגרות
מועד הבחינה: קיץ תשע"ז, **מועד ב**
מספר השאלון: 035182
נספח: דפי נוסחאות ל־3 יחידות לימוד
תרגום לאנגלית (3)

Mathematics
Reform for Meaningful Learning Program
First Questionnaire — 3 Points

מתמטיקה
על פי תכנית הרפורמה ללמידה משמעותית
שאלון ראשון מ-3 יחידות לימוד

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 the 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.

Good Luck!

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) לטיוטה יש להשתמש בדפים ש**בנוסח העברי של השאלון** (כולל הדפים שבסופו).
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 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 price of a sofa was 4,000 shekels. The price of the sofa increased by 25%.
   א. Calculate the price of the sofa after the price increase.
   ב. In order for the price of the sofa to be 4,250 shekels, by what percentage must the price after the increase be reduced?

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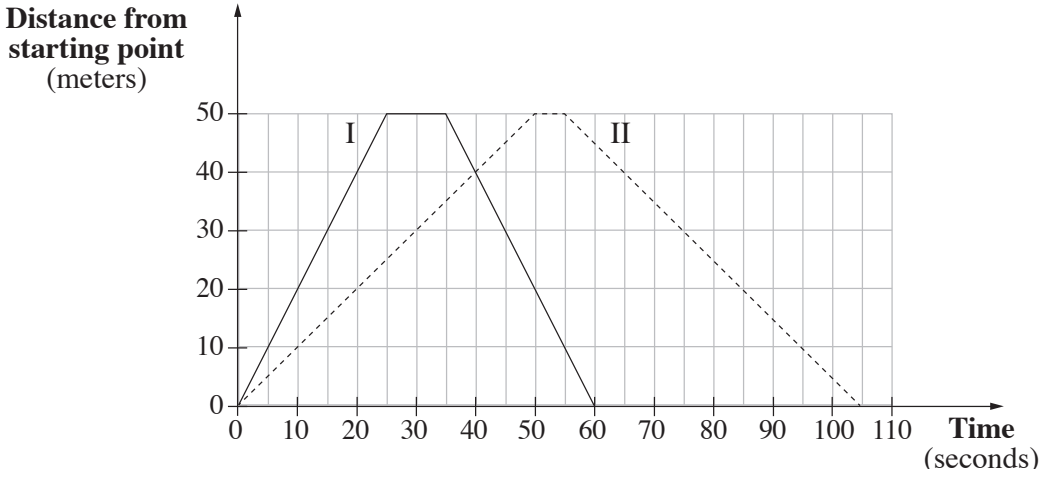
2. Michal and Galya are swimming in a swimming pool that is 50 meters in length. They swim along the length of the pool, from one end to the other. When they reach the opposite end, they rest a little and then swim back in the opposite direction, to their starting point.

   Michal swims faster than Galya.

   Michal and Galya began swimming at the same time and they both swam from one end of the pool to the other and back, once.

   The figure below shows two graphs (I and II), which depict the distance of the two swimmers from the starting point, as a function of time.



א. Match each swimmer with the graph that represents her swim. Explain.

ב. How long did each swimmer rest at the opposite end of the pool?

ג. How long after they began swimming did the swimmers meet?

ד. When they met, were the swimmers moving in the same direction or in opposite directions? Explain.

ה. How many seconds before Galya did Michal finish her swim?

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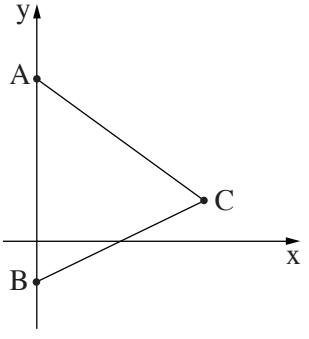
3. David is training for a race. On the first day of training, David ran 3 kilometers, and on every subsequent day, he ran $\frac{1}{2}$ kilometer more than on the previous day.
   - א. How many kilometers did David run on his seventh day of training?
   - ב. How many kilometers in total did David run during the first seven days of training?

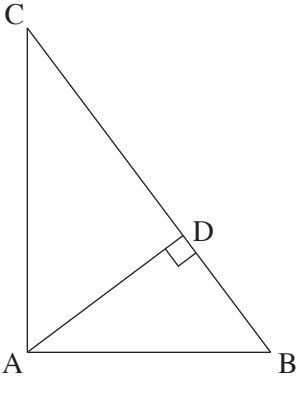
4. The line whose equation is $y = \frac{1}{2}x - 2$, the line whose equation is $y = -\frac{3}{4}x + 8$, and the y-axis form Triangle ABC, as shown in the figure.



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

Trigonometry

5. In the right triangle ABC ($\sphericalangle A = 90^o$), AD is the height to the hypotenuse [יתר] (see figure).
   Given: AB = 15 cm; AD = 12 cm
   - א. Find the size of the angle ABD.
   - ב. Calculate the length of the leg [ניצב] AC.
   - ג. Calculate the area of the triangle ABC.
   - ד. Calculate the length of the hypotenuse BC.



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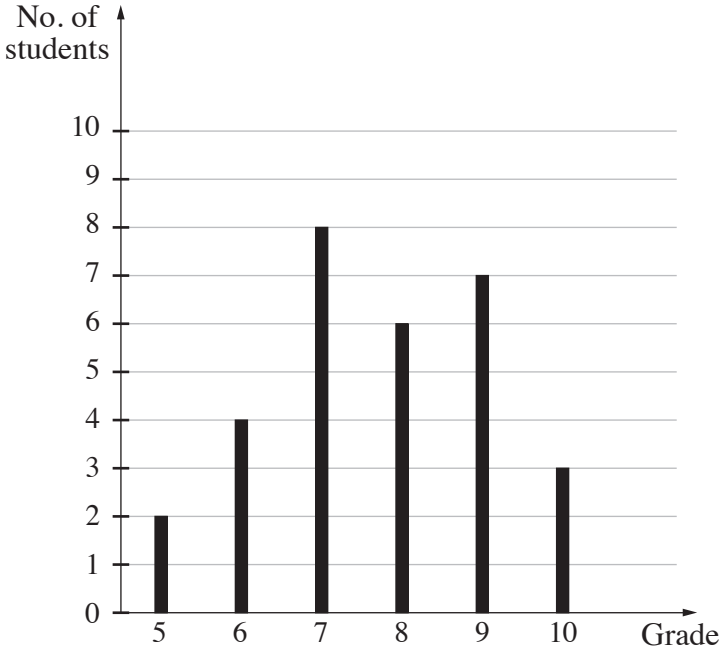
Probability and Statistics

6. Below is a bar chart showing the distribution of grades received in a Tanach test by all the students in a certain class.



א. How many students are there in this class?

ב. What is the average grade in Tanach in this class?

ג. What is the median grade [חציון הציונים] in this class? Explain.

ד. What is the modal grade [הציון השכיח] in this class? Explain.

ה. One of the students in this class is randomly chosen.
What is the probability that this student's grade will be higher than the average grade?

Good Luck!

בהצלחה!