

Mathematics

3 Points — 2nd Exam

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 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 the 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.

מ ת מ ט י ק ה

3 יחידות לימוד — שאלון שני

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) לטייטה יש להשתמש בדפים שבנוסח העברי של השאלון (כולל הדפים שבסופו). שימוש בטייטה 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.

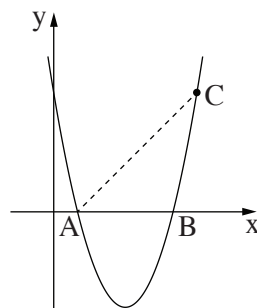
Write all of your calculations and answers in the Hebrew exam booklet.

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 parabola $y = x^2 - 6x + 5$ intersects the x-axis at Points A and B, as shown in the figure at the right.



- א. Find the coordinates of Points A and B.
- ב. Specify the intervals on which the parabola is positive.
Point C is located on the parabola, and its x-coordinate is 6.
- ג. Find the y-coordinate of Point C.
- ד. (1) Find the length of Segment AB.
(2) Calculate the area of Triangle ABC.

2. An athlete walked continuously for 6 hours.

Every hour, he walked a distance equal to $\frac{5}{6}$ of the distance he had walked in the preceding hour.

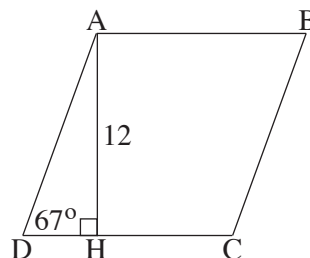
In the third hour, he walked 5,400 meters.

- א. Calculate the distance the athlete walked in the first hour.
- ב. Calculate the distance the athlete walked in the 6 hours.

3. The price of Car א today is 140,000 shekels.
Its price drops by 12% each year.
- א. Find what Car א's price will be one year from now and two years from now.
- The price of Car ב drops each year by a constant percentage. The price of Car ב today is 110,000 shekels, and one year from now, it will be 101,200 shekels.
- ב. Find by what percentage Car ב's price drops each year.
- ג. Which car will be more expensive 5 years from now, Car א or Car ב?

Trigonometry

4. In Rhombus ABCD, the length of Height AH to Side DC is 12 cm.
The size of the acute angle of the rhombus is 67° (see figure).
- א. Calculate the length of a side of the rhombus.
- ב. Calculate the perimeter of the rhombus.
- ג. Calculate the area of Triangle AHC.



Probability and Statistics

5. A jug contains 5 white balls and 3 black balls.
- One ball is removed from the jug randomly and left outside the jug.
- The rest of the balls in the jug are mixed up and another ball is removed randomly.
- א. What is the probability that the first ball removed from the jug was white and the second ball removed was black?
- ב. What is the probability that both balls removed from the jug were black?
- ג. What is the probability that both balls removed from the jug were of the same color?

6. The egg weight in a hen house is normally distributed with an average of 62 grams.

An egg weighing more than 68 grams is classified as heavy.

16% of the eggs in the hen house are heavy.

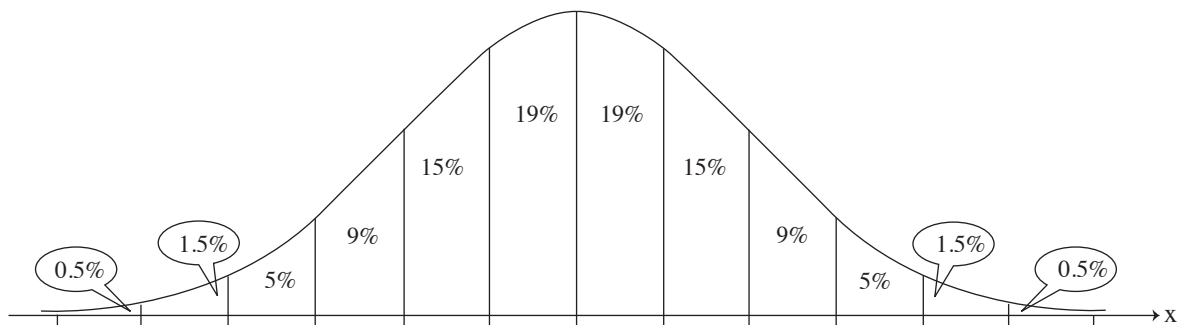
א. Find the standard deviation of the weight distribution of the eggs in the hen house.

ב. Find the probability that a randomly chosen egg from the hen house weighs less than 56 grams.

ג. Given: 160 eggs in the hen house weigh less than 56 grams.

According to the normal distribution curve, how many eggs are there in the hen house in total?

Below is the normal distribution curve 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