

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.
לכל 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**.
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.
שימוש בטייטה אחרת עלול לגרום לפסילת הבחינה.

Note: At the end of the exam there is draft paper for your use. Do not add any other pages to your exam booklet.

שים לב: בסוף הבחינה מצורפים דפי טייטה לשימושך. אין להוסיף דפים אחרים למחברת 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 on this exam 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. Last year, the price of a closet plus delivery to the customer's home was a total of 1,800 shekels.

This year, the price of the closet increased by 25% relative to its price last year. The cost of delivery remained unchanged.

This year, the price of the closet plus delivery to the customer's home is a total of 2,200 shekels.

Calculate what the price of the closet (without delivery) was last year.

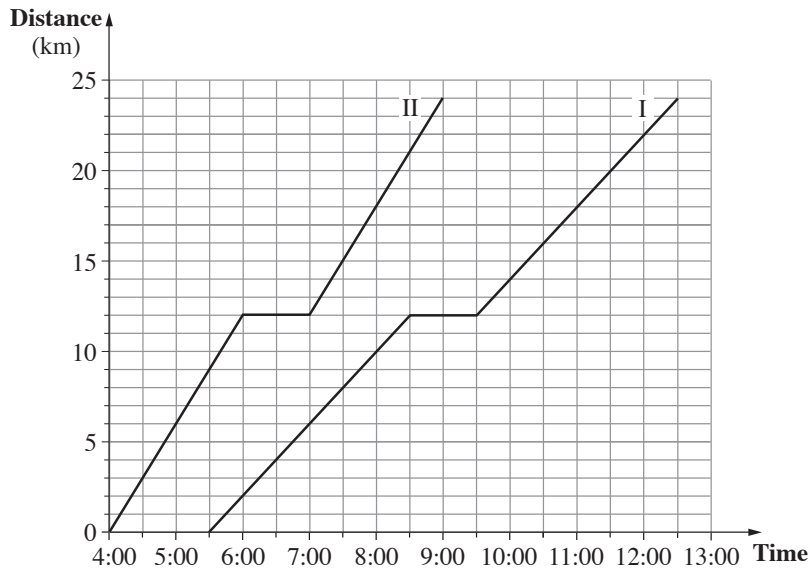
2. Two groups of walkers set off on a hike along the same route.

The fast group walked at a speed of 6 km per hour.

The slow group walked at a speed of 4 km per hour.

Each of the groups took one rest break during the hike.

Graphs I and II below describe the distance of each of the two groups from the starting point, as a function of time.

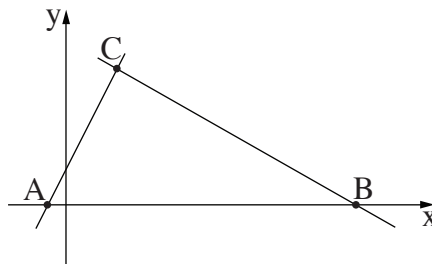


Study the graphs and answer the items א-ג below.

- א. Which graph, I or II, corresponds to the fast group?
- ב. At what distance from the starting point was each of the groups at 8:30 am?
- ג. At what time was the slow group located a distance of 18 km from the starting point?
- ד. What was the distance between the two groups when the fast group finished its rest break?

3. The line whose equation is $y = 2x + 2$ and the line whose equation is $y = -\frac{1}{2}x + 9\frac{1}{2}$, together with the x-axis, form Triangle ABC, as shown in the figure to the right.

- א. Find the coordinates of Points A and B.
- ב. Find the length of Segment AB.
- ג. Find the coordinates of Point C.
- ד. Calculate the area of Triangle ABC.



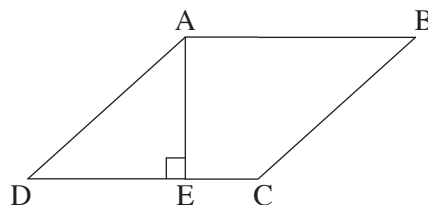
Trigonometry

4. In Rhombus ABCD, AE is the height to Side DC (see figure).

Given: $AE = 12.5$,

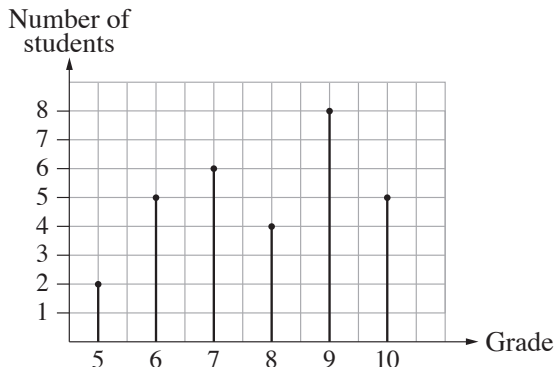
the acute angle of the rhombus is 42° .

- א. Calculate the side length of the rhombus.
- ב. Calculate the perimeter of the rhombus.
- ג. Calculate the length of Segment DE.
- ד. Calculate the area of Triangle DEA.



Probability and Statistics

5. The bar chart below describes the distribution of Tanach grades gained by all the students in a particular 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 [חציון] grade? Explain.
- ד. What is the modal [שכיח] grade? Explain.

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

- ה. What is the probability that the grade of the student who is chosen is lower than the average grade?

6. Two balanced dice, one red and the other white, are thrown simultaneously.
- א. What is the probability that both dice will show the same number?
 - ב. What is the probability that the red dice will show the number 5 and the white dice will show the number 1?
 - ג. What is the probability that the red dice will show the number 6 and the white dice will show a number that is smaller than 4?

Good Luck!

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בהצלחה!

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