

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.

בשאלון זה שש שאלות.

Each question is worth 25 points.

כל שאלה — 25 נקודות.

You may answer as many questions as you like, but the maximum number of points you can earn is 100.

מוותר 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.

- (1) **כתוב את כל החישובים והתשובות בנוסח העברי של השאלון.**
אסור לכתוב על הפסים שבשוליים.

- (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. Use of other draft paper may lead to the disqualification of your exam.

- (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 שבגוף הנוסח העברי של השאלון. שימוש בטייטה אחרת עלול לגרום לפסילת הבחינה.

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

שים לב: בסוף הבחינה מצורפים דפי טייטה לשימושך. אין להוסיף דפים אחרים למחברת הבחינה.

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 chair is 300 shekels. The price rose by 20%.

א. Calculate the price of the chair after the rise in price.

Tomer bought 8 chairs. He bought some of them before the price rose and the rest after the price rose.

He paid a total of 2,580 shekels for all the chairs he bought.

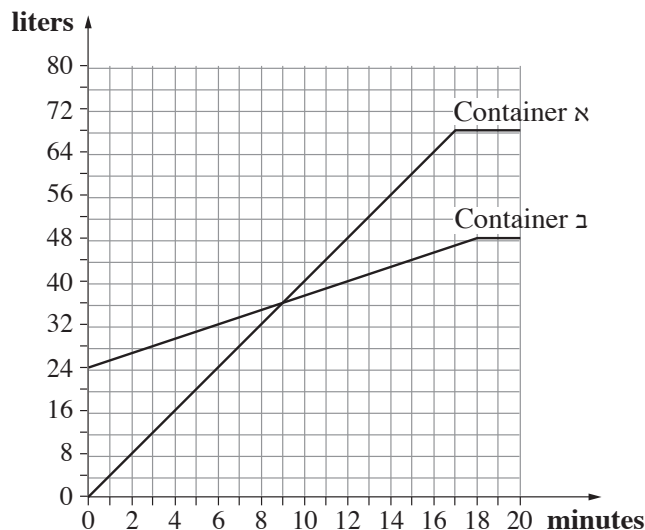
ב. How many chairs did he buy before the price rose?

2. Given: two containers, Container א and Container ב.

Container א is empty and Container ב contains 24 liters of water.

At a given moment, two faucets are turned on and release a stream of water into each of the containers until they are full.

The two graphs below describe the quantity of water in both containers over time (from the moment the faucets are turned on).



Refer to the graphs and answer Items 7-8.

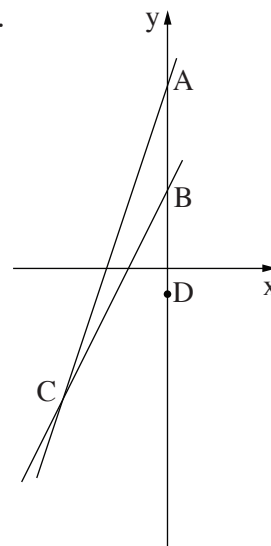
8. How many liters of water were there in each of the containers 6 minutes after the faucets were turned on?
9. (1) How many minutes after the faucets were turned on did Container א contain 44 liters of water?
(2) How many minutes after the faucets were turned on did Container ב contain 44 liters of water?
10. After the faucets were turned on, for how many minutes was the quantity of water in Container ב greater than the quantity of water in Container א?
7. After the faucets were turned on, how many minutes did it take for Container ב to fill up?

3. The line CA whose equation is $y = 3x + 7$ and the line CB whose equation is $y = 2x + 3$, together with the y-axis, form Triangle ABC, as shown in the figure.

- א. Find the coordinates of Vertex A and Vertex B.
- ב. Find the coordinates of Vertex C.

Point D is located on the y-axis such that Point B is the midpoint of Segment AD.

- ג. Find the coordinates of Point D.
- ד. Find the equation of Line CD.



Trigonometry

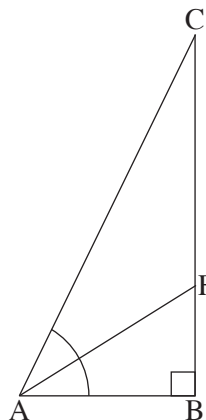
4. ABC is a right triangle ($\angle ABC = 90^\circ$).

Point F is located on Side BC.

AF bisects Angle BAC (see figure).

Given: $\angle BAC = 64^\circ$, $AC = 13$ cm.

- א. Calculate the length of Leg AB.
- ב. Calculate the length of Segment BF.
- ג. Calculate the length of Segment FC.



Probability and Statistics

5. A game of dominoes has 28 different tiles.

Each tile is marked with two of the following numbers: 0, 1, 2, 3, 4, 5, 6.

The domino tiles look like this:

0 0	0 1	0 2	0 3	0 4	0 5	0 6
1 1	1 2	...	...	...	1 6	
2 2	...	...	...	2 6		
3 3	...	...	3 6			
4 4	...	4 6				
5 5	5 6					
6 6						

One of the 28 domino tiles is chosen at random.

- א. What is the probability that the chosen tile is marked with the two numbers 6, 6?
- ב. What is the probability that the chosen tile is marked with two identical numbers (a "double")?
- ג. What is the probability that the chosen tile is marked with two numbers that add up to 10?
- ד. What is the probability that precisely one of the numbers marked on the chosen tile is the number 3?

6. A student obtained the following scores in five tests: 50, 70, 80, 90, and 90 (possible scores range between 0 and 100).

- א. (1) Calculate the student's average score for the five tests.
(2) What is the student's median [חציון] score for the five tests? Explain.

The student took a sixth test.

- ב. What is the highest average this student can obtain for the six tests? Explain.

Good Luck!

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בהצלחה!

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