

UZUPEŁNIA ZDAJĄCY

KOD			PESEL													
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*miejsce
na naklejkę*

**EGZAMIN MATURALNY
Z MATEMATYKI
POZIOM PODSTAWOWY
DODATKOWE ZADANIA W JĘZYKU ANGIELSKIM**

DATA: **23 maja 2018 r.**

GODZINA ROZPOCZĘCIA: **9:00**

CZAS PRACY: **80 minut**

LICZBA PUNKTÓW DO UZYSKANIA: **30**

Instrukcja dla zdającego

1. Sprawdź, czy arkusz egzaminacyjny zawiera 10 stron (zadania 1–18). Ewentualny brak zgłoś przewodniczącemu zespołu nadzorującego egzamin.
2. Rozwiązania i odpowiedzi zapisz w miejscu na to przeznaczonym przy każdym zadaniu.
3. Pisz czytelnie. Używaj długopisu/pióra tylko z czarnym tuszem/atramentem.
4. Nie używaj korektora, a błędne zapisy wyraźnie przekreśl.
5. Pamiętaj, że zapisy w brudnopisie nie będą oceniane.
6. Możesz korzystać z *Wybranych wzorów matematycznych*, cyrkla, linijki oraz kalkulatora prostego.
7. Na tej stronie oraz na karcie odpowiedzi wpisz swój numer PESEL i przyklej naklejkę z kodem.
8. Nie wpisuj żadnych znaków w części przeznaczonej dla egzaminatora.



MMA-R2_1A-182

NOWA FORMUŁA

Information for tasks 1–3

Given are points $A = (-2, 1)$ and $B = (3, 4)$.

Task 1. (0–1)

The length of the line segment AB is equal to

- A. $\sqrt{34}$ B. $\sqrt{50}$ C. $\sqrt{10}$ D. $\sqrt{26}$

Task 2. (0–1)

Points A and B lie on the line given by the equation

- A. $y = \frac{3}{5}x + \frac{1}{5}$ B. $y = \frac{3}{5}x + \frac{11}{5}$ C. $y = \frac{5}{3}x + \frac{11}{3}$ D. $y = \frac{5}{3}x + \frac{7}{3}$

Task 3. (0–1)

The centre of the line segment AB is the point

- A. $S = \left(\frac{1}{2}, \frac{3}{2}\right)$ B. $S = \left(\frac{5}{2}, \frac{3}{2}\right)$ C. $S = \left(\frac{5}{2}, \frac{1}{2}\right)$ D. $S = \left(\frac{1}{2}, \frac{5}{2}\right)$

Task 4. (0–1)

The line l passes through the point $A = (-5, 6)$ and is parallel to the line k given by the equation $y = 2x - 7$. The line l has the following equation:

- A. $y = -\frac{1}{2}x + \frac{7}{2}$ B. $y = -\frac{1}{2}x + \frac{17}{2}$ C. $y = 2x - 4$ D. $y = 2x + 16$

Task 5. (0–1)

The exponential function f is given by the equation $f(x) = 2^x$. The graph of a function g is obtained by translating the graph of function f three units upwards along the axis Oy . Hence, function g is defined by the equation

- A. $g(x) = 2^{x+3}$ B. $g(x) = 2^x + 3$ C. $g(x) = 2^{x-3}$ D. $g(x) = 2^x - 3$

NOTES

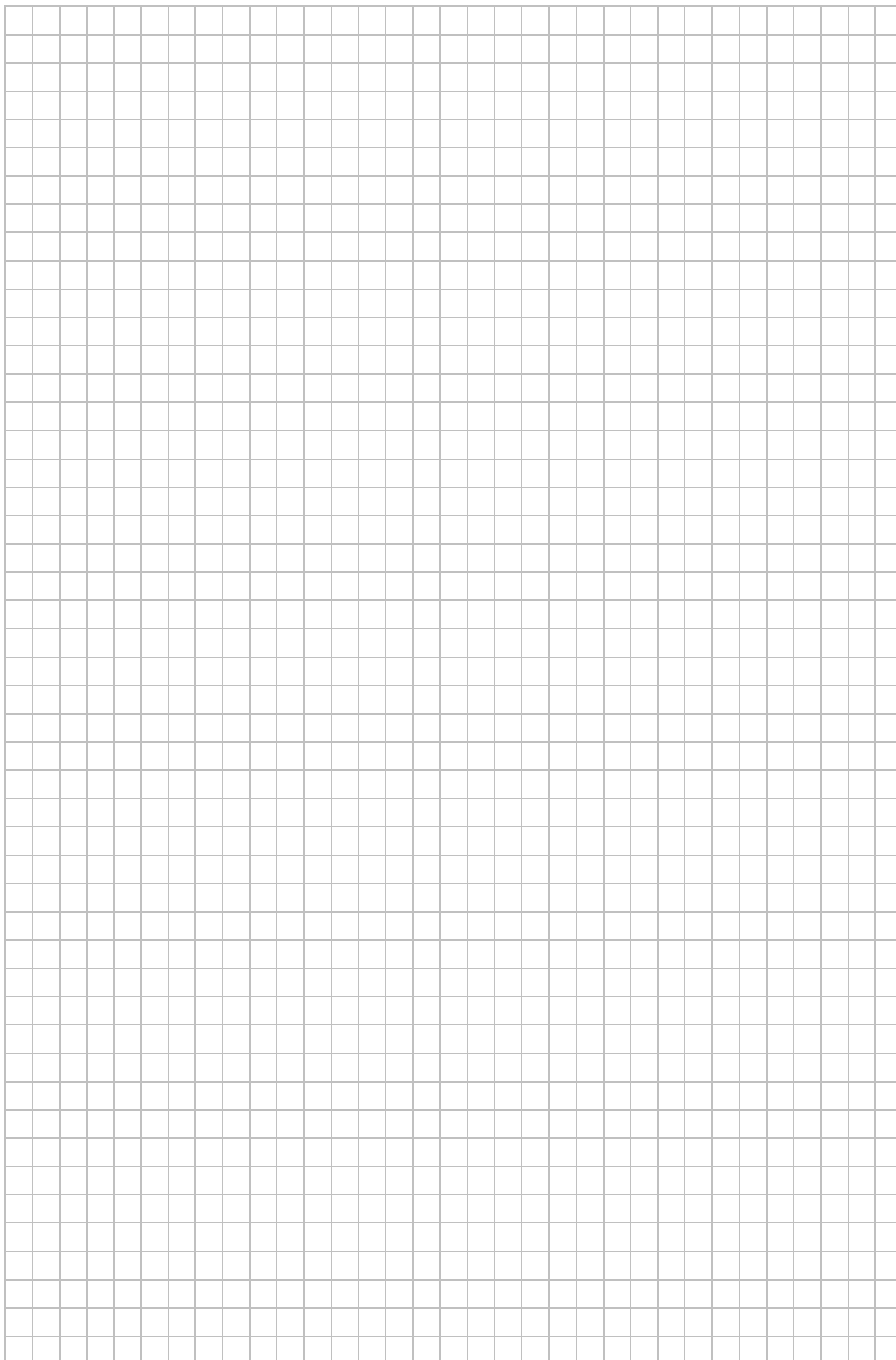
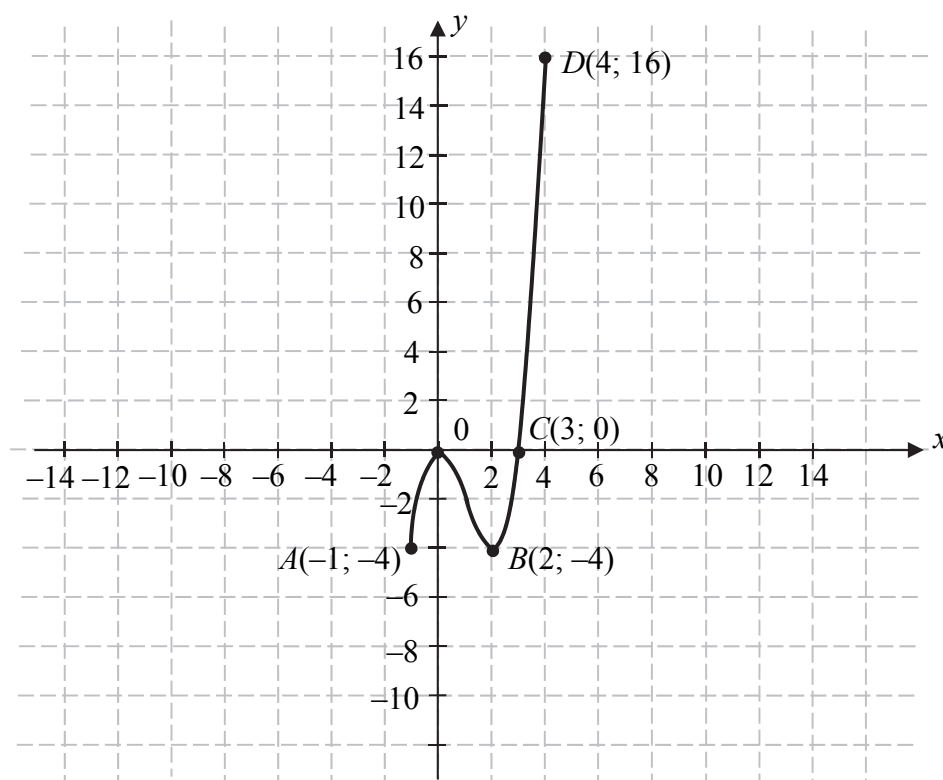


Illustration for tasks 6.–9.

The illustration shows the graph of a function f . It has two zeros which are both integers.

**Task 6. (0–1)**

The domain of function f is the set:

- A. $\langle -1, 16 \rangle$ B. $\langle -4, 16 \rangle$ C. $\langle -1, 4 \rangle$ D. $\langle -1, 3 \rangle$

Task 7. (0–1)

The range of function f is the set:

- A. $\langle -1, 4 \rangle$ B. $\langle -1, 3 \rangle$ C. $\langle 0, 16 \rangle$ D. $\langle -4, 16 \rangle$

Task 8. (0–1)

Function f reaches its minimum for:

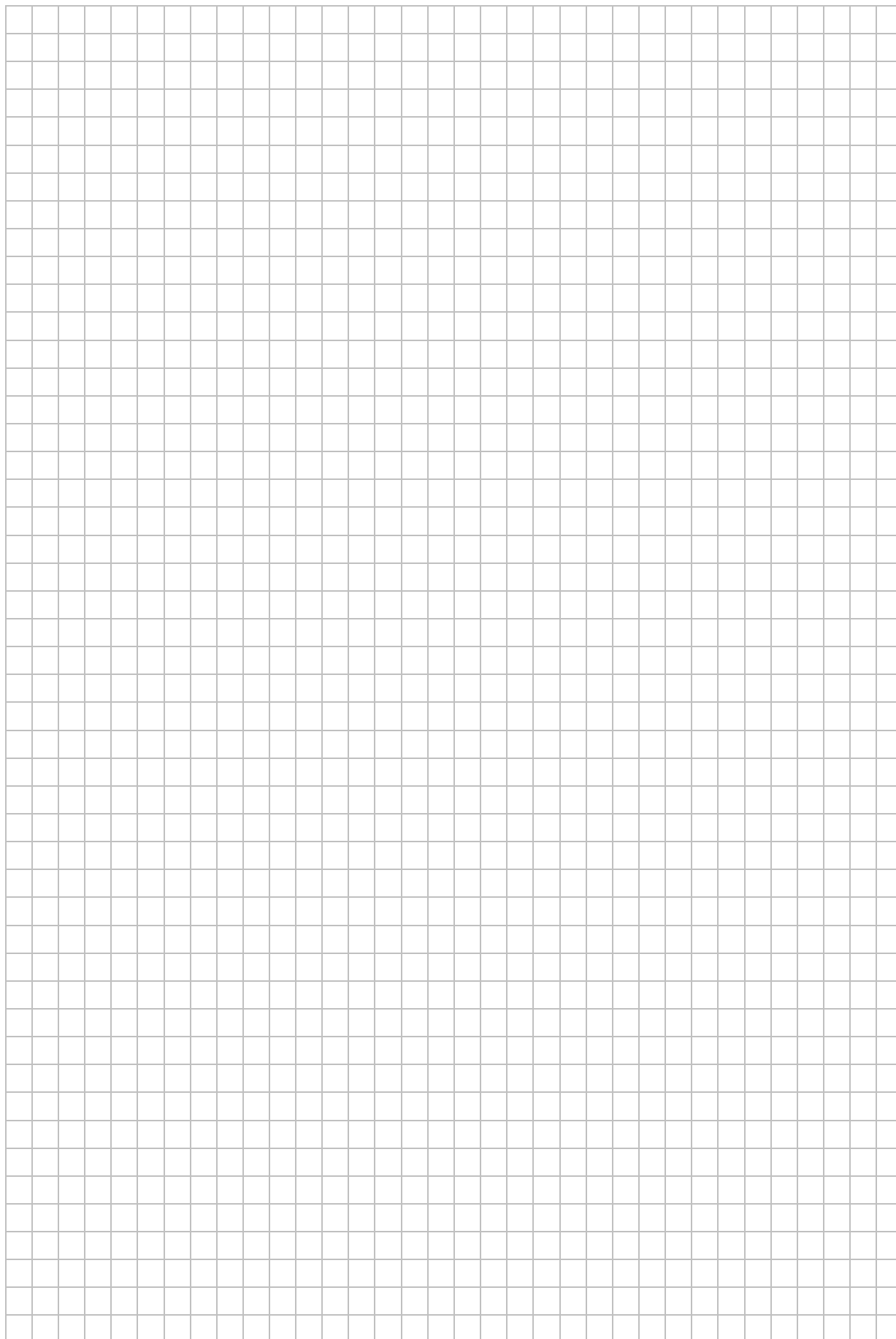
- A. $x = 0$ and $x = 3$ B. $x = -1$ and $x = 2$ C. $x = -1$ and $x = -4$ D. $x = 2$ and $x = 4$

Task 9. (0–1)

The zeros of function f are the numbers

- A. 0 and 3 B. -1 and 2 C. -1 and -4 D. 2 and -4

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Task 10. (0–1)

In February, the price of a certain product remained constant, but on March 1st it was increased by 10%. After a week, the new price was decreased by 20%. As a result of these two changes, the initial price of the product was decreased by

- A. 12% B. 14% C. 9% D. 4%

Task 11. (0–1)

The set of all real numbers x which satisfy the inequality: $-3 < 2x - 1 < 3$ is

- A. $(-3, 3)$ B. $\langle -3, 3 \rangle$ C. $(-1, 2)$ D. $\langle -1, 2 \rangle$

Task 12. (0–1)

The base of a pyramid is a rectangle, and one of the side edges of this pyramid is perpendicular to the base. The number of faces of this pyramid which are right-angled triangles is

- A. 2 B. 1 C. 4 D. 3

Task 13. (0–3)

The sequence (a_n) is a geometric sequence defined for $n \geq 1$, with $a_1 = \frac{1}{4}$ and $a_4 = 2$.

Complete the following sentences.

- a) The seventh term of the sequence is
- b) The product of the second and the eighth term of the sequence is
- c) If the sum of n initial terms of the sequence is equal to $\frac{7}{4}$, then the number n is equal to

Task 14. (0–3)

ABC is a triangle with $|AC| = |BC| = 13$ and $|AB| = 10$. Complete the following sentences.

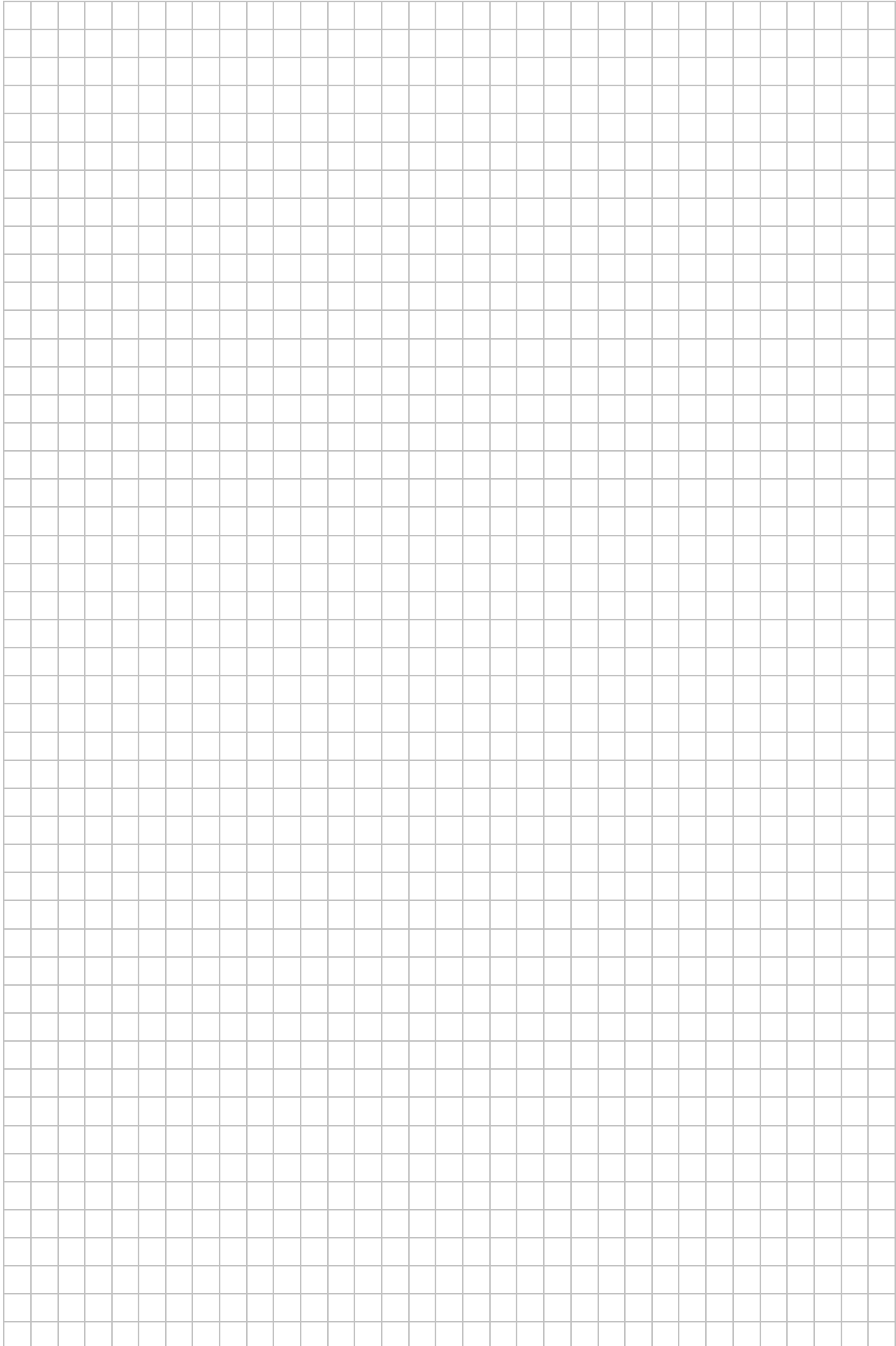
- a) The area of the triangle ABC equals
- b) The sine of the angle ACB equals
- c) The sine of the angle ABC equals

Task 15. (0–2)

Two fair, six-sided dice are thrown. A is an event in which the sum of the numbers thrown is a prime number. Complete the following sentences.

- a) The sample space consists of elements.
- b) The probability of the event A is

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Task 16. (0–3)

A quadratic function f is given by the equation: $f(x) = 2x^2 - 8x - 10$. Complete the following sentences.

- The interval in which the function is decreasing is
- The range of the function is the interval:
- The function assumes non-negative values if and only if the x arguments belong to the set

Task 17. (0–3)

In an arithmetic sequence (a_n) defined for all natural numbers such that $n \geq 1$, the first term is $a_1 = -7$ and the sum of the first twenty terms equals $S_{20} = 1000$. Complete the following sentences.

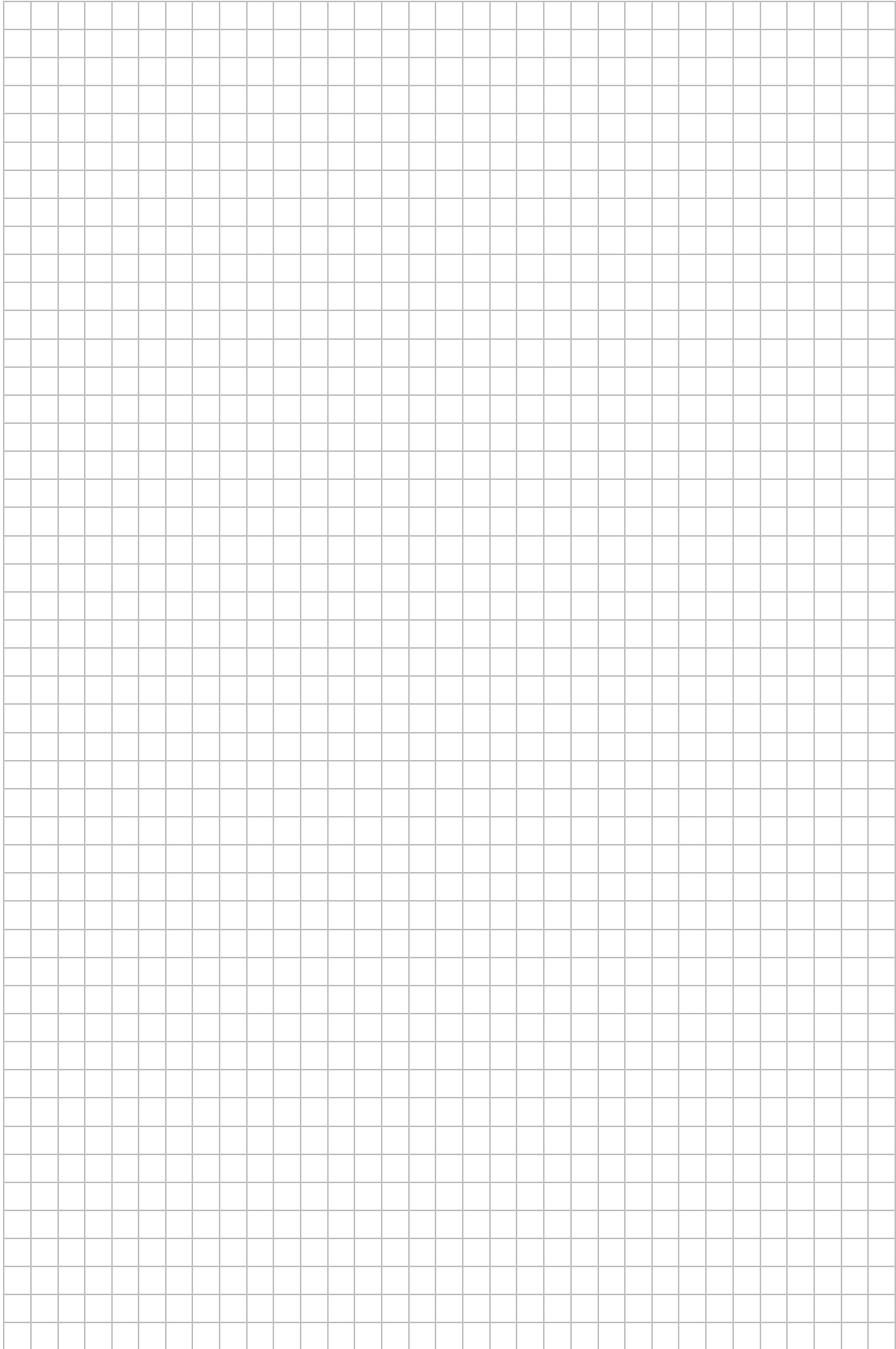
- The common difference of this arithmetic sequence is
- The twentieth term of this sequence is
- The n -th term of this sequence is given by the formula: $a_n =$

Task 18. (0–4)

The height of a regular quadrilateral prism is 2 units larger than the edge of the base of the prism, while the sum of the length of all edges of the prism is 92. Complete the following sentences.

- The height of the prism is
- The volume of the prism is
- The length of the diagonal of the prism is
- If α is the angle between the diagonal of the prism and its base, then the cosine of the angle α is

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NOTES (*will not be assessed*)