

TEST DIAGNOSTYCZNY

MATEMATYKA

POZIOM PODSTAWOWY

DODATKOWE ZADANIA W JĘZYKU ANGIELSKIM

Data: 23.03.2026 r.

Czas pracy: 80 minut

Liczba punktów do uzyskania: 25

Dane zdającego

Imię i nazwisko:

Klasa:

Instrukcja dla zdającego

1. Sprawdź, czy arkusz zawiera 14 stron (zadania 1 - 15). Ewentualny brak zgłoś przewodniczącemu zespołu nadzorującego egzamin.
2. Rozwiązania i odpowiedzi zapisz w miejscu do tego przeznaczonym przy każdym zadaniu.
3. Pisz czytelnie. Używaj długopisu lub pióra tylko z czarnym 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.

Task 1 (0-1)

Complete the sentence. Choose the correct answer from the options given below.

The number

$$\sqrt[3]{\frac{1}{27}} \cdot \left(\frac{1}{729}\right)^2 \cdot \left(\frac{1}{81}\right)^{-4}$$

is equal to

- D.
- 3^6

[illegible]

Task 2 (0-3)

Write down each sentence as an algebraic expression.

- (a) The sum of square root of a and the fifth power of b :
- (b) The absolute value of difference between a and cube root of b :
- (c) The reciprocal of the product of a and b :

A full-page view of a blank sheet of graph paper. The grid consists of thin, light gray horizontal and vertical lines forming small squares across the entire page. There are no margins, text, or other markings on the paper.

Task 3

A quadratic function is given by the formula: $f(x) = x^2 - 6x + 8$.

Task 3.1 (0-1)

Decide if the following statements are true or false. Select 'T' if the statement is true, or 'F' if it is false.

The range of the function f is the interval $\langle 2; +\infty \rangle$.	T	F
The function f has two different zeros.	T	F

**Task 3.2 (0-2)**

Complete the sentences. Select the correct answer from options A–D and E–H.

1. The formula of the function f in vertex form is

A. $f(x) = (x - 3)^2 + 1$

C. $f(x) = (x + 3)^2 - 1$

B. $f(x) = (x - 3)^2 - 1$

D. $f(x) = (x + 3)^2 + 1$

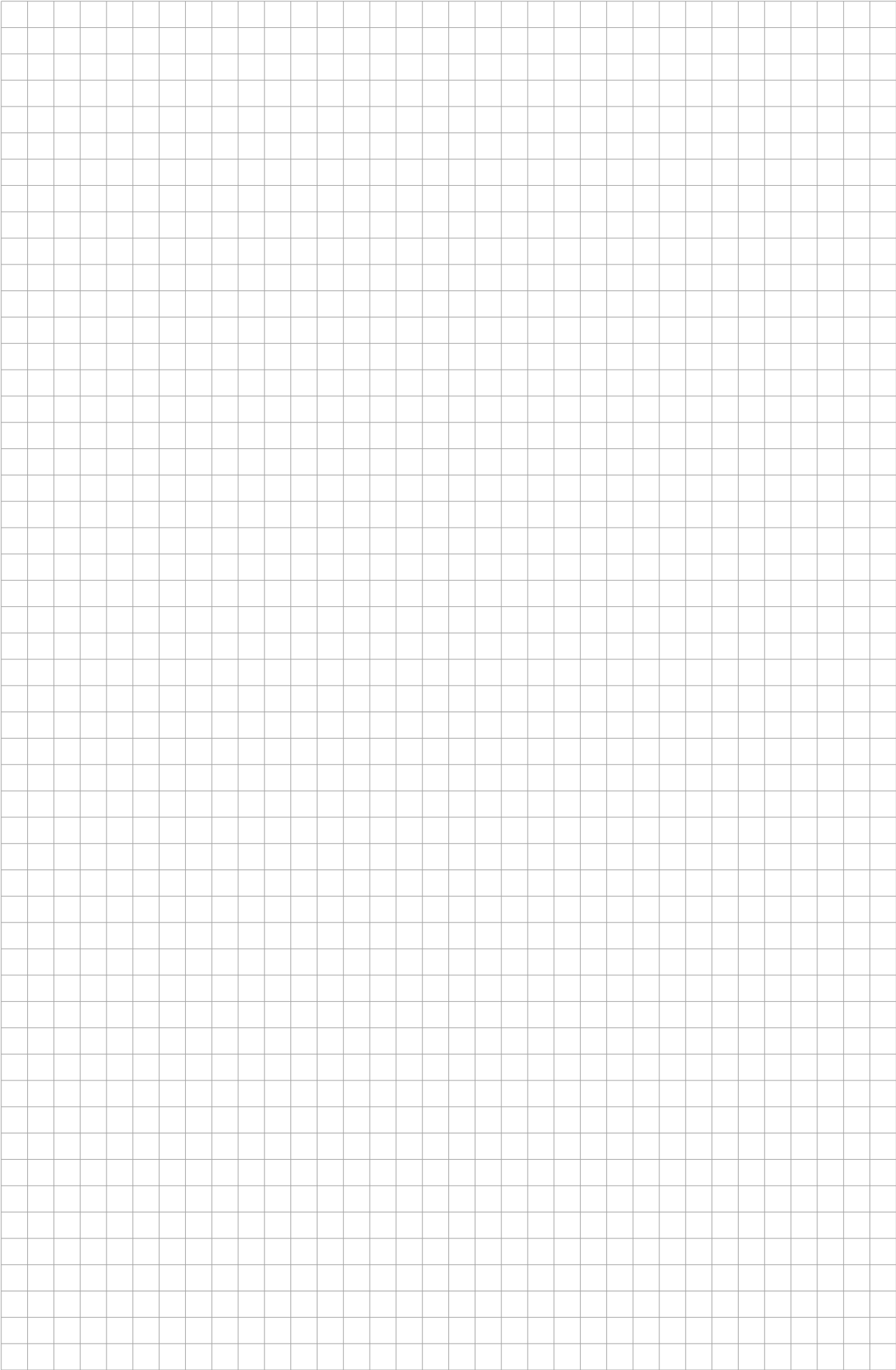
2. The formula of the function f in factored form is

E. $f(x) = (x - 2)(x + 4)$

G. $f(x) = (x - 2)(x - 4)$

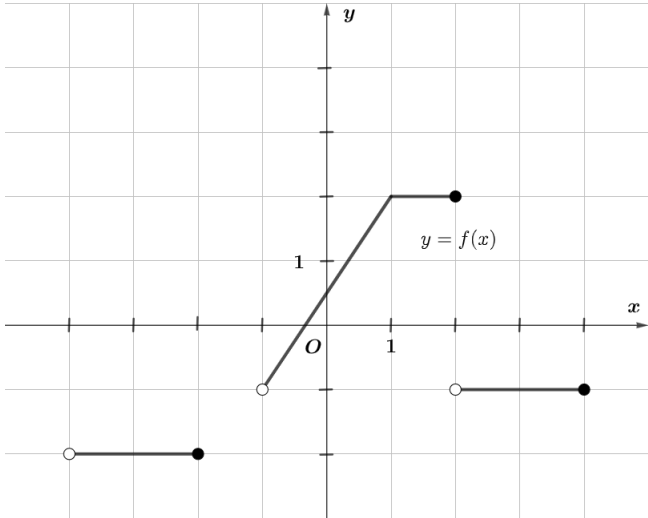
F. $f(x) = (x + 2)(x + 4)$

H. $f(x) = (x + 2)(x - 4)$



Task 4

The figure shows the graph of a function f in the Cartesian coordinate system (x, y) .



Task 4.1 (0-1)

Complete the sentence. Select the correct answer from the options given below.

The solution for the inequality $f(x) \leq -1$ is the interval

- A. $(-4; -2) \cup (2; 4)$
- B. $\langle -4; -2 \rangle$
- C. $(-4; -2) \cup (2; 4)$
- D. $\langle 2; 4 \rangle$

[illegible]

Task 4.2 (0-2)

Complete the following sentences so that they are true.

1. The domain of the function f is the interval
2. The range of the function f is

Task 5. (0-1)

A sequence (a_n) is given by the formula $a_n = (-1)^{n+1} \cdot (n+1)$ for each natural number $n \geq 1$.

Decide whether the following statements are true or false. Select 'T' if the statement is true or 'F' if the statement is false.

The fourth term of the sequence (a_n) is equal to 5.	T	F
All terms of the sequence are negative.	T	F

[illegible]

Task 6. (0-1)

Complete the sentence. Choose the correct answer from the options given below.

The three-term sequence $(-32, 2x + 1, -8)$ is geometric for

- A.** $x = -9.5$ **B.** $x = -8.5$ **C.** $x = 8.5$ **D.** $x = 9.5$

[illegible]

Task 7. (0-1)

In the triangle $\triangle ABC$ the side AB has length 4 cm, the side AC has length 6 cm. The measure of the angle $\angle CAB$ is equal to 30° .

Complete the sentence. Select the correct answer from the options given below.

The area of the triangle $\triangle ABC$ is equal to

A. 12 cm^2

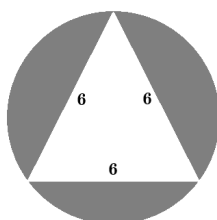
B. $12\sqrt{3} \text{ cm}^2$

C. $6\sqrt{3} \text{ cm}^2$

D. 6 cm^2

**Task 8. (0-1)**

The side of the equilateral triangle inscribed in the circle is equal to 6. (figure below)



Complete the sentence. Select the correct answer from the options given below.

The area of the shaded region is

A. $4(4\pi - 3\sqrt{3})$

B. $4(3\pi - 4\sqrt{3})$

C. $3(4\pi - 3\sqrt{3})$

D. $3(3\pi - 4\sqrt{3})$



Task 9.(0-1)

In the parallelogram $ABCD$ the ratio between lengths $|AB|$ and $|AD|$ is equal $4 : 3$. The cosine of the acute angle $\angle DAB$ is equal to $\frac{\sqrt{3}}{2}$ and the height of the parallelogram is equal to 6.

Complete the sentence. Select the correct answer from the options given below.

The perimeter of the parallelogram $ABCD$ is equal to

- A. 38 B. 42 C. 56 D. 52

[illegible]

Task 10.(0-1)

A linear function f is given by the formula $f(x) = \frac{1}{2}x + 3$. The graph of a linear function g passes through the point $P(1, -3)$ and is perpendicular to the graph of the function f .

Complete the sentence. Select the correct answer from the options given below.

The formula of the function g is

- A. $g(x) = 2x - 1$ B. $g(x) = -2x - 1$ C. $g(x) = -2x + 1$ D. $g(x) = 2x + 1$

A full-page view of a blank sheet of graph paper. The grid consists of thin, light gray horizontal and vertical lines forming small squares across the entire page. There are no margins, text, or other markings on the paper.

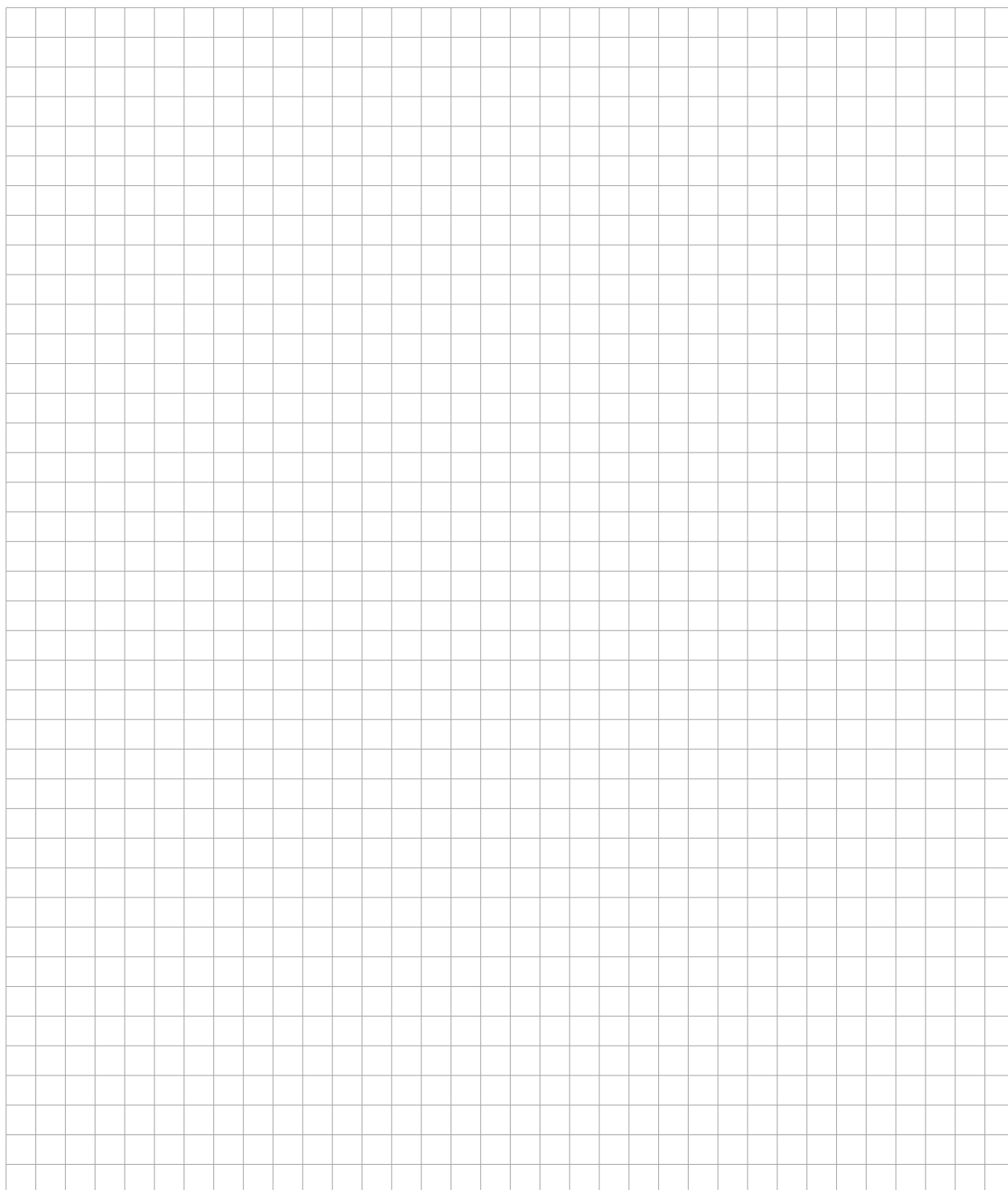
Task 11. (0-2)

A point $S(4, 2)$ is the centre of the circle $\mathcal{O}$ that passes through the point $A(-4, 8)$.

Complete the following sentences so that they are true.

1. The equation of the circle $\mathcal{O}$ is

2. The point B that is the end of the diameter AB has coordinates



Task 12. (0-2)

Given a cone that the length of the slant is equal 13 and the tangent of angle between the slant and the base of the cone is 0.24.

Complete the following sentences so that they are true.

1. The volume of the cone is equal to
2. The area of the lateral face is equal to

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

Task 13. (0-1)

Given a set A of all three-digit numbers greater than 301 created from 0, 2, 3, 4, 5.

Complete the following sentence so that it is true.

The number of elements of the set A is equal to

- A. 60 B. 64 C. 74 D. 81

A full-page sheet of white graph paper with a light gray grid. The grid consists of small squares, approximately 10 units wide by 10 units high, forming a coordinate plane. There are no margins or additional markings on the page.

Task 14. (0-2)

In a random experiment, two fair cubical dice are thrown. Each of the dice has a different number of pips on each side: from 1 to 6. Let A denote an event in which the product of the outcomes is less than 20.

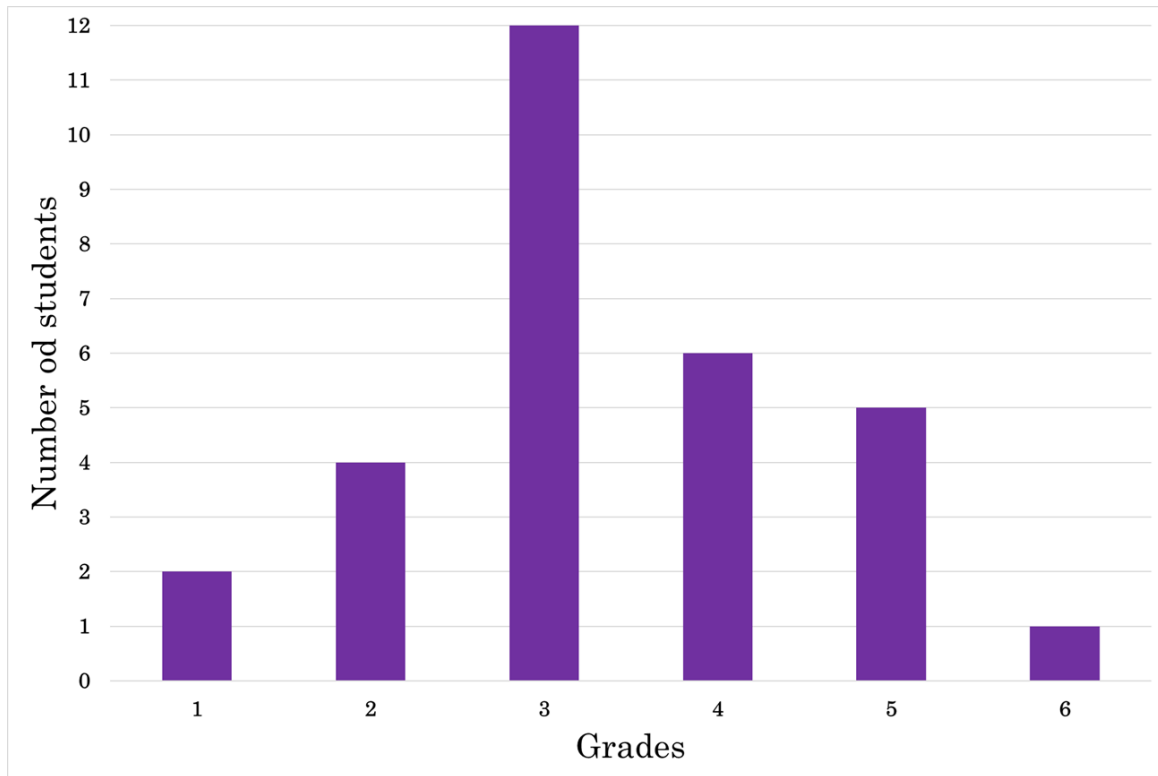
Complete the following sentences so that they are true.

1. The sample space of the described random experiment has elements.
2. The probability of the event A is equal to

[illegible]

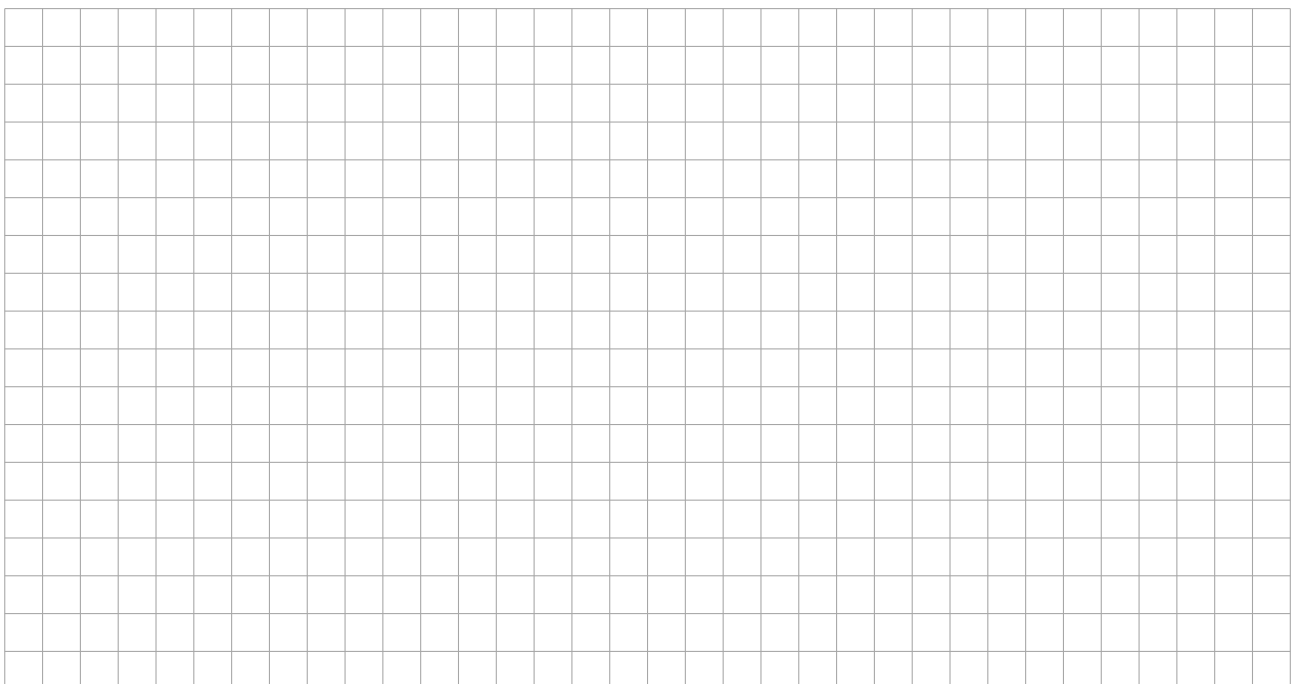
Task 15. (0-2)

The chart depicts a set of semester grades in mathematics of all students in class IV E.



Complete the following sentences using the chart.

1. The mode of the semester grades in maths of these students is equal to
2. The median of the semester grades in maths of these students is equal to



NOTES (not subject to evaluation)

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