CENTRALNA KOMISJA EGZAMINACYJNA

Arkusz zawiera informacje prawnie chronione do momentu rozpoczęcia egzaminu.

MMA 2017

UZUPEŁNIA ZDAJĄCY

KOD

PESEL

miejsce na naklejkę

EGZAMIN MATURALNY Z MATEMATYKI

POZIOM PODSTAWOWY

DODATKOWE ZADANIA W JĘZYKU ANGIELSKIM

DATA: **24 maja 2017 r.**

GODZINA ROZPOCZĘCIA: **09:00**

CZAS PRACY: **80 minut**

LICZBA PUNKTÓW DO UZYSKANIA: **30**

NOWA FORMUŁA

Instrukcja dla zdającego

1. Sprawdź, czy arkusz egzaminacyjny zawiera 13 stron (zadania 1–19). 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-172

MMA 2017

Task 1. (0–1)

It may be assumed that 0.3 is an approximation of $\frac{5}{16}$. What is the percentage error in this approximation?

A. 2.5% **B.** 0.025% **C.** 4% **D.** 0.04%

Task 2. (0–1)

Among those listed below, the only positive number is:

A. $(-3)^0$ **B.** -3^0 **C.** $(-3)^{2017}$ **D.** -3^{2017}

Task 3. (0–1)

If $m=5$ and $n=4$, then the difference of squares of *m* and *n* is:

A. 41 **B.** 1 **C.** 81 **D.** 9

Task 4. (0–1)

$\begin{cases} 2x+y=3 \\ 4x-5y=-1 \end{cases}$ is a system of equations which is represented in the two-dimensional system of coordinates by:

A. an infinite set.

B. an empty set.

C. exactly two distinct points.

D. exactly one point.

Task 5. (0–1)

The sum of all roots of the equation $(x-3)(x-2)(x+6)=0$ is:

A. -1 **B.** 1 **C.** -11 **D.** 11

Task 6. (0–1)

The graph of a linear function *f* is a line which crosses the axes of the coordinate system at $K=(-5,0)$ and $L=(0,7)$. Therefore, the equation of function *f* is:

A. $f(x)=-\frac{7}{5}x+7$ **B.** $f(x)=\frac{7}{5}x+7$ **C.** $f(x)=\frac{5}{7}x-5$ **D.** $f(x)=-\frac{5}{7}x-5$

NOTES

Task 7. (0–1)

Numbers $2x$, $4x$, 18 (in the given order) are the first three terms of an arithmetic sequence. The first term of the sequence is:

A. 2.25 **B.** 1.5 **C.** 6 **D.** 3

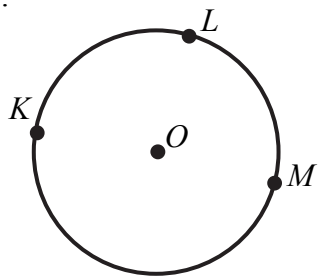
Task 8. (0–1)

α is a positive acute angle. The cosine value of α is three times greater than its sine value. Therefore, the tangent value of α is:

A. $\frac{1}{3}$ **B.** 3 **C.** $\sqrt{10}$ **D.** $\frac{\sqrt{10}}{10}$

Task 9. (0–1)

K, L and M are three points which lie on a circle with centre O (see the illustration). The obtuse angle KOM is 170°.



The acute angle KLM is:

A. 85° **B.** 80° **C.** 75° **D.** 70°

Task 10. (0–1)

The acute angle of a rhombus is 30° and the length of one side of the rhombus is 30. The area of the rhombus is:

A. 900 **B.** 90 **C.** 450 **D.** 45

Task 11. (0–1)

Line k with the equation $y=-\frac{1}{3}x+11$ is parallel to line l which contains point $K=(-3,9)$.

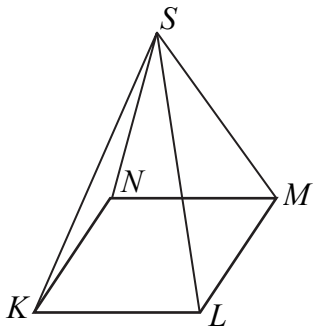
The equation of line l is:

A. $y=-\frac{1}{3}x+10$ **B.** $y=-\frac{1}{3}x+8$ **C.** $y=3x+18$ **D.** $y=3x$

NOTES

Task 12. (0–1)

The base of a right quadrangular pyramid *KLMNS* is the square *KLMN* (see the illustration).



The angle between the lateral edge and the base of the pyramid is:

A. $\sphericalangle KLN$ **B.** $\sphericalangle KLM$ **C.** $\sphericalangle LMS$ **D.** $\sphericalangle KMS$

Task 13. (0–1)

The set of numbers $\langle 1, 200)$ contains exactly *k* natural even numbers which are not divisible by 3. Therefore:

A. $k = 67$ **B.** $k = 66$ **C.** $k = 34$ **D.** $k = 33$

Task 14. (0–3)

The odd-numbered terms of a given geometric sequence (a_n), where $n \geq 1$, are negative numbers and $a_5 = -1$. Even-numbered terms of the sequence are positive numbers and $a_{10} = \frac{1}{32}$. Complete the following sentences.

a) The common ratio *q* of the geometric sequence (a_n) is …… .

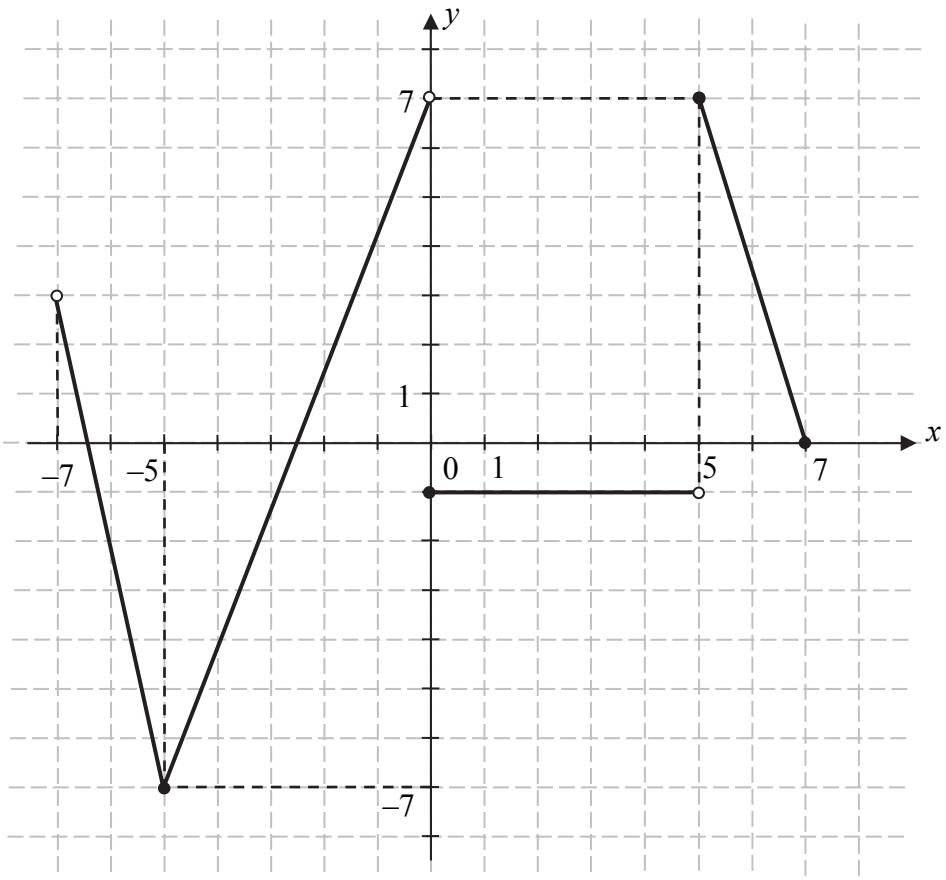
b) In the geometric sequence (a_n), the number of terms greater than $\frac{1}{32}$ is …… .

c) In the sequence (a_n), the sum of integer terms is …… .

NOTES

Task 15. (0–5)

The illustration shows the graph of a function f.



Complete the following sentences.

a) The domain of function f is the set D = …… .

b) The range of function f is Z_W = …… .

c) The maximum of function f equals ……. .

d) The longest interval in which function f is increasing is …… .

e) The number of x-intercepts of function f equals …… .

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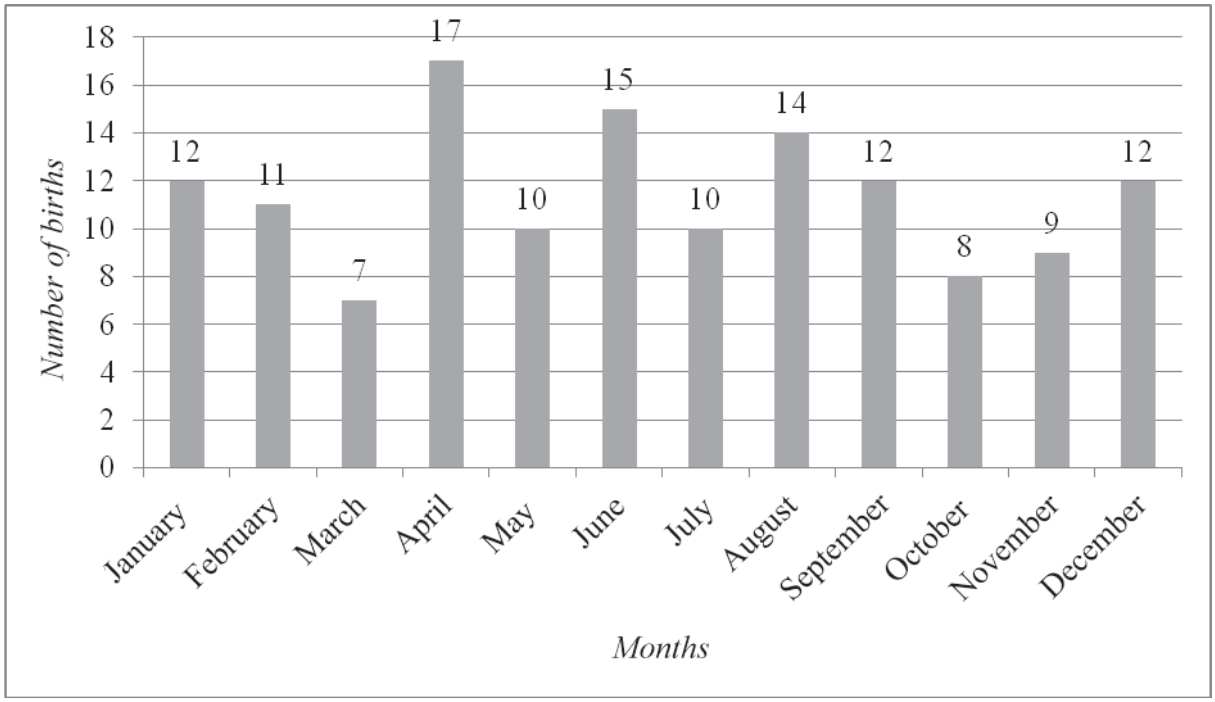
Task 16. (0–2)

The diagram below shows the number of births in individual months of 2016 in X, an urban-rural municipality.



Complete the following sentences.

a) The median of the dataset which contains the monthly numbers of births in 2016 in municipality X equals …… .

b) In 2016, the birth of the hundredth new born baby in municipality X took place in the month of …… .

Task 17. (0–2)

The radius of a base of cylinder is 10. The axial cross-section of the cylinder is a square. Complete the following sentences.

a) The total surface area of the cylinder is …… .

b) The volume of the cylinder is …… .

NOTES

Task 18. (0–2)

A random experiment consists in a simultaneous toss of two coins and a cubic dice. The result of tossing a coin may be heads or tails. Each of the six faces of the dice contains a different number of dots. The number of the dots belongs to the set $\{1, 2, 3, 4, 5, 6\}$. Complete the following sentences.

a) The probability of an event the result of which is two tails and a face with six dots is …… .

b) The probability of an event whose result is two tails and a face with an even number of dots is …… .

Task 19. (0–3)

Two points, $M=(-5,-3)$ and $N=(3,11)$, are located on the Cartesian plane. Complete the following sentences.

a) The equation of the line *MN* is …… .

b) The distance of point *M* from point *N* is …… .

c) The midpoint of the segment *MN* is $S=(x_S, y_S)$, where $x_S =$ ..... and $y_S =$ ..... .

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