موسسه متروپل سعادت آباد

سعادت آباد – بلوار دریا – روبروی خیابان صرافها – پلاک 54 – **واحد** 10

METROPOLSAADATABAD

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METROPOLSAADATABAD

1. $\frac{a}{b}=\frac{4}{5}$, $\frac{b}{c}=\frac{6}{7}$, $\frac{c}{d}=\frac{5}{9}$

$a+b+c+d=304$

$\Rightarrow (d+b)-(c+a)=?$

A) 44 B) 50 C) 68 D) 88 E) 90

2. $\left.\begin{array}{l} n(A\backslash B)=8 \\ n(A'\cap B)=7 \\ n(A'\cap B')'=19 \end{array}\right\} \Rightarrow n(A')'=?$

A)9 B) 11 C) 12 D) 13 E) 15

3. $\sqrt{-3}.\sqrt{-6}.\sqrt{-9}.\sqrt{-12}.\sqrt{-15}.\sqrt{-18}=?$

A) $-324\sqrt{15}$ B) $-324\sqrt{5}$ C) $-216\sqrt{5}$

D) $-108\sqrt{15}$ E) $-108\sqrt{5}$

4. $x^5-ax^4+3x^2-x$ | x^2+1

$-$ | $Q(x)$

k

$Q(1)=Q(2) \Rightarrow k=?$

A) -6 B) -5 C) 0 D) 3 E) 9

5. $\dfrac{a^3+b^3+3ab(a+b)-1}{a^2+b^2+2ab+a+b+1}=?$

A) 1 B) $a+b$ C) $a+b-1$

D) $(a+b)^2$ E) $a-b+1$

6. $f:\mathbb{R}\to[-\dfrac{13}{4},\infty)$

$f(x)=x^2+5x+3 \implies f^{-1}(3)=?$

A) 0 B) 1 C) 2 D) 3 E) 5

7. $\dfrac{8xy-2x^2y^2}{2-(xy)^{1/2}}=\dfrac{2xy+(xy)^{3/2}}{k} \implies k=?$

A) $\dfrac{1}{4}$ B) $\dfrac{1}{2}$ C) 1 D) 2 E) 8

8. $\left.\begin{array}{l} a+\dfrac{1}{\frac{a}{b}}=\dfrac{17}{2} \\ a=2 \end{array}\right\} \implies a+b=?$

A) 9 B) 11 C) 13 D) 15 E) 17

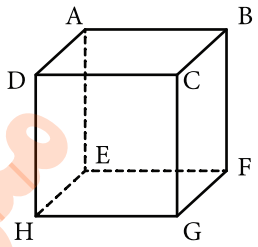
9. $\sqrt{a} - \frac{4}{\sqrt{a}} = 3 \implies \sqrt[3]{4a} = ?$

A) 2 B) 4 C) 8 D) 16 E) 32

10. $\frac{3^{38} - 3^{36} + 3^{37} - 3^{35}}{(48.3^{14} + 8.3^{15})^2} = ?$

A) $\frac{2}{9}$ B) $\frac{3}{2}$ C) $\frac{9}{2}$ D) $\frac{32}{3}$ E) $\frac{27}{2}$

11.



Rastgele seçilen 2 köşenin aynı ayrıt üzerinde bulunmama olasılığı nedir?

What is the probability that two randomly selected vertices are not on the same edge?

Welche Wahrscheinlichkeit besteht, dass zwei zufällig ausgewählte Ecken nicht auf derselben Kante liegen?

Quelle est la probabilité que 2 sommets choisis au hasard ne soient pas sur la même diagonale?

Какова вероятность того, что две случайно выбранные вершины не лежат на одном ребре?

A) $\frac{3}{7}$ B) $\frac{15}{28}$ C) $\frac{4}{7}$ D) $\frac{5}{7}$ E) $\frac{11}{14}$

12. $csc\ 2x + cot\ 2x = \dfrac{\sqrt{5}}{2} \implies sin\ x = ?$

A) $\dfrac{1}{3}$ B) $\dfrac{2}{3}$ C) $\dfrac{\sqrt{5}}{3}$ D) $\dfrac{2}{\sqrt{5}}$ E) $\dfrac{\sqrt{5}}{2}$

13. $\prod_{k=1}^{3}\sum_{n=1}^{4}(2^{k-2}) = ?$

A) 8 B) 16 C) 32 D) 64 E) 128

14. $\left.\begin{array}{l} \dfrac{a}{3} = \dfrac{b}{4} \\ 3a - 2b = 12 \end{array}\right\} \implies a + b = ?$

A) 18 B) 30 C) 65 D) 72 E) 84

15. $\dfrac{9,\overline{2} - 0,\overline{1}}{0,\overline{1} + 1,\overline{2} + 2,\overline{3} + \cdots + 8,\overline{9}} = ?$

A) $0,\overline{1}$ B) $0,\overline{2}$ C) 1 D) 2 E) $2,\overline{2}$

16. $\left.\begin{array}{l} 2x + 2y - 4z = 6 \\ x + 3y - 6z = 3 \end{array}\right\} \Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

17. $\left(\frac{1}{25}\right)^{k+6} < 5^{3k-1}$

$k \in \mathbb{Z} \Rightarrow \min(k) = ?$

A) -3 B) -2 C) -1 D) 1 E) 2

18. $|a + 2b - 3| + \sqrt{4a^2 - 12ab + 9b^2} = 0$

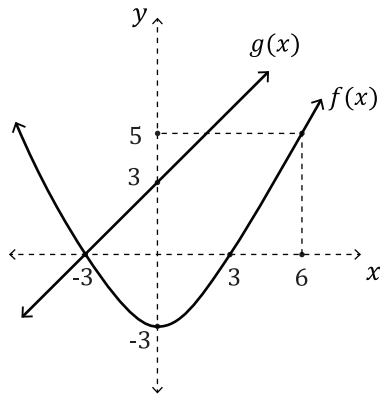
$\Rightarrow a.b = ?$

A) $\frac{7}{27}$ B) $\frac{18}{49}$ C) $\frac{3}{7}$ D) $\frac{7}{9}$ E) $\frac{54}{49}$

19. $\prod_{k=0}^{9}(3k^2 - 19k + 20) = ?$

A) -80 B) 0 C) 22 D) 68 E) 88

20.



$\Rightarrow (gof^{-1})(5) - (fog)(3) = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

21. $2\sqrt{x+1} + 3 = 5 \cdot \sqrt[4]{x+1}$

denkleminin kökleri x_1 ve x_2'dir.

The roots of the equation are x_1 and x_2.

Die Wurzeln der Gleichung sind x_1 und x_2.

Les racines de l'équation sont x_1 et x_2.

Корни уравнения равны x_1 и x_2.

$\Rightarrow 16(x_1 + x_2) = ?$

A) 16 B) 32 C) 48 D) 65 E) 104

22.

I. $\dfrac{(x^2+1)\cdot(x^2-4)}{x^2-3x+2} < 0$

II. $\dfrac{(x-1)^2\cdot(x+1)}{x-3} \leq 0$

ifadesinin çözüm kümesi aşağıdakilerden hangisidir?

Which of the following is the solution set of the expression?

Was ist die Lösungsmenge des Ausdrucks?

Quel est l'ensemble des solutions de?

Что из следующего является набором решений выражения?

A) $[-1, 2]$ B) $(-2, 3)$ C) $(1, 3]$

D) $[-1, 1)$ E) $(0, 1)$

23. $f(x) = \dfrac{\sqrt{16x^4 + 81 - 72x^2}}{2x^2 - 5x + 3}$

$\Rightarrow \lim\limits_{x \to \frac{3^+}{2}} f(x) + \lim\limits_{x \to -\frac{3^-}{2}} f(x) = ?$

A) -6 B) -2 C) 0 D) 8 E) 12

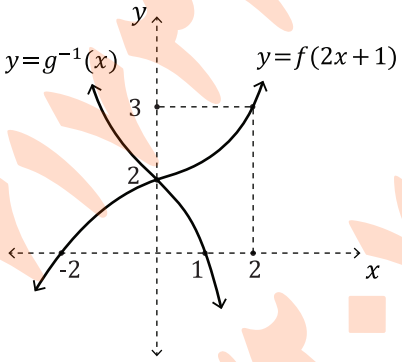
24. $\left.\begin{array}{l} f(x) = \dfrac{4x + m}{nx - 3} \\ f'(0) = -2 \end{array}\right\} \Rightarrow m \,.\, n = ?$

A) 1 B) 6 C) 8 D) 10 E) 12

25. $\left.\begin{array}{l} f(x) = 5^{3x+1} \\ f(4x) = m \cdot \big(f(x)\big)^4 \end{array}\right\} \Rightarrow m = ?$

A) $-\dfrac{1}{25}$ B) $\dfrac{1}{125}$ C) $\dfrac{1}{25}$ D) $\dfrac{1}{16}$ E) $\dfrac{1}{5}$

26.



$\Rightarrow \dfrac{f^{-1}\big(g^{-1}(1)\big) - g(2)}{g\Big(f\big(-f(5)\big)\Big)} = ?$

A) -5 B) -3 C) -1 D) 1 E) 3

27. $2x + 3y = 12$

$\Longrightarrow max\,(x\,.\,y) = ?$

A) -12 B) 0 C) 2 D) 4 E) 6

28. $\int \frac{2}{2x-5} dx = ?$

A) $\ln|2x-5| + c$ B) $2\ln|2x-5| + c$

C) $3\ln|2x-5| + c$ D) $-2\ln|2x-5| + c$

E) $-\ln|2x-5| + c$

29. $6^a = 18^b \Longrightarrow \frac{a+b}{a-b} = ?$

A) $2 + 3\log_3 2$ B) $2 + 2\log_2 3$

C) $3 + 2\log_3 2$ D) $3 + 2\log_2 3$

E) $3 + 3\log_3 2$

30. $\left.\begin{array}{l} z = 3\sqrt{2} + 3\sqrt{2}\,i \\ w = \sqrt{3} + i \end{array}\right\} \Longrightarrow \frac{z^2}{w^3} = ?$

A) $\frac{9}{2}$

B) $3(cos\frac{\pi}{6} + isin\frac{\pi}{6})$

C) $4\left(cos\frac{\pi}{3} + isin\frac{\pi}{3}\right)$

D) $5 + 17i$

E) $9(cos\frac{\pi}{4} + isin\frac{\pi}{4})$

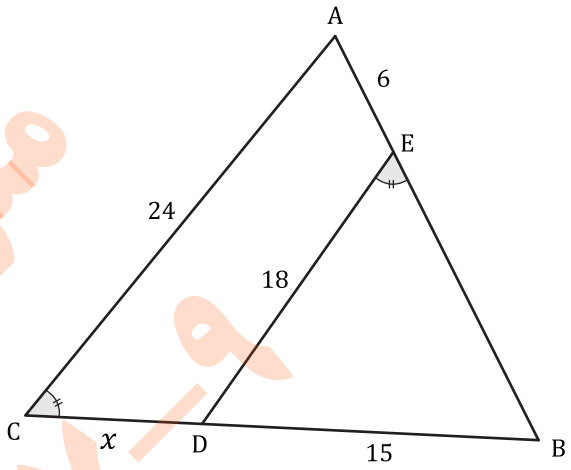
31. $A = \begin{bmatrix} 10206 & 10201 \\ 10208 & 10203 \end{bmatrix} \Rightarrow [\det(A)]^2 = ?$

A) 64 B) 81 C) 100 D) 121 E) 144

32. $\lim\limits_{x\to 3} \dfrac{64^{\left(\frac{2x-5}{\sqrt[4]{3x^2+16x+6}}\right)}}{\sqrt{x^2-2x+m-8}} = 2 \quad \Rightarrow m = ?$

A) 6 B) 7 C) 8 D) 9 E) 10

33.



$m(\widehat{DEB}) = m(\widehat{BCA})$

$|AC| = 24\ cm$

$|AE| = 6\ cm$

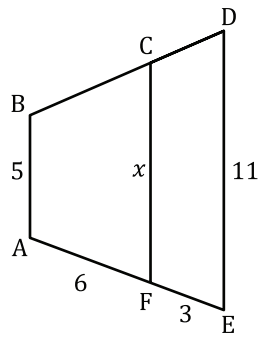
$|DE| = 18\ cm$

$|BD| = 15\ cm$

$\Rightarrow x = ?\ cm$

A) $\frac{11}{3}$ B) 7 C) $\frac{15}{2}$ D) 13 E) 14

34.



$[AB] \,//\, [CF] \,//\, [DE]$

$|AB| = 5\,cm$

$|ED| = 11\,cm$

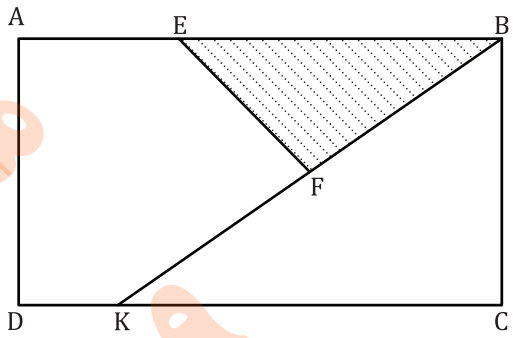
$|AF| = 6\,cm$

$|FE| = 3\,cm$

$\Longrightarrow \quad x = ?\,cm$

A) 6 B) 7 C) 8 D) 9 E) 10

35.



ABCD bir dikdörtgen
ABCD is a rectangle
Das Viereck *ABCD* ist ein Rechteck
ABCD est un rectangle
ABCD — прямоугольник

K, F, B doğrusal
K, F, B linear
K, F, B linear
K, F, B linéaire
K, F, B - линейный

$|KC| = 4|DK|$

$|KF| = |BF|$

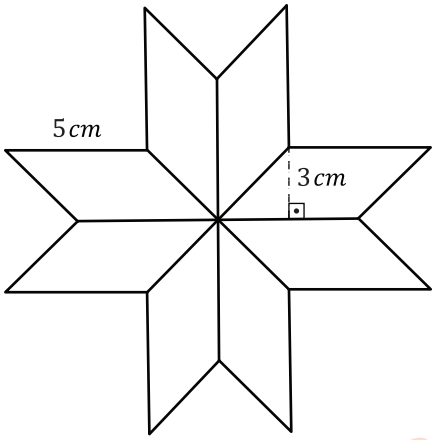
$|EB| = 2|AE|$

$A(EFB) = 25\,cm^2$

$\Longrightarrow A(ABCD) = ?\;cm^2$

A) 65 B) 125 C) 150 D) 254 E) 305

36.



Yukarıdaki şekil birbirine eş paralelkenarlardan oluştuğuna göre şeklin alanı kaç cm^2'dir?

The figure given above consists of congruent parallelograms. Find the area of the figure in cm^2.

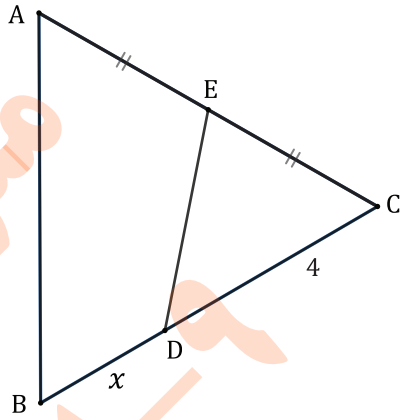
Angenommen, die obige Figur besteht aus kongruenten Parallelogrammen, wie groß ist die Fläche der Figur in cm^2?

La figure ci-dessus étant formée de parallélogrammes, combien de cm^2 est l'aire de la figure?

Приведенная выше фигура состоит из конгруэнтных параллелограммов. Найдите площадь фигуры в cm^2.

A) 60 B) 75 C) 90 D) 120 E) 150

37.



ABC bir eşkenar üçgen
ABC is an equilateral triangle
ABC ist ein gleichseitiges Dreieck
ABC est un triangle équilatéral
ABC равнобедренный треугольник

$|AE| = |EC|$

$|DC| = 4\ cm$

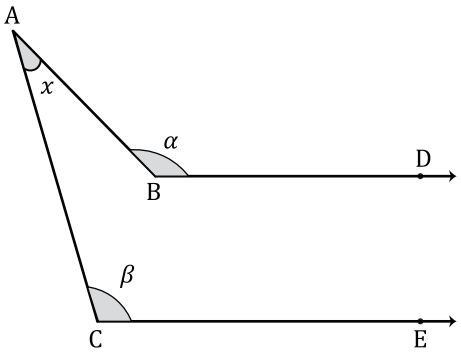
$|ED| = 2|BD|$

$\Longrightarrow x = ?\ cm$

A) $\frac{2\sqrt{5}}{5}$ B) $\sqrt{5}$ C) $\frac{4\sqrt{5}}{5}$

D) $2\sqrt{5}$ E) $3\sqrt{5}$

38.



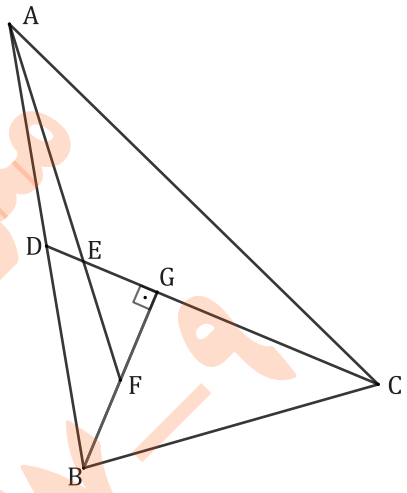
$[BD \,//\, [CE$

$\alpha - \beta = 27°$

$\Longrightarrow \; x = ?$

A) 18° B)27° C) 30° D)45° E) 63°

39.



G, *ABC* üçgeninin ağırlık merkezi
G is the centroid of the triangle *ABC*
G ist der Schwerpunkt des Dreiecks *ABC*
G, centre de gravité du triangle *ABC*
G - центр тяжести (центриод) треугольника *ABC*

$[BG] \perp [CD]$

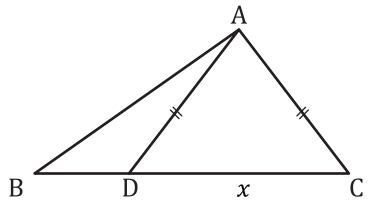
$|BF| = |FG| = 4\ cm$

$|AF| = 12\sqrt{3}\ cm$

$\Longrightarrow |DE| = ?\ cm$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $2\sqrt{2}$ D) $3\sqrt{3}$ E) 4

40.



$|AC| = |AD|$

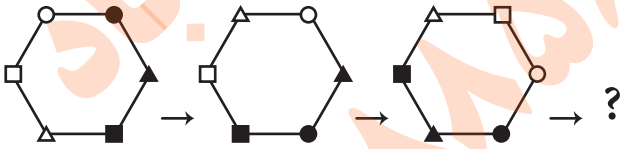
$|AB| = |BD| + 7$

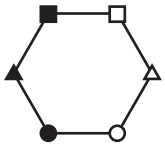
$|CD| = x$

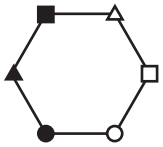
$x \in \mathbb{Z} \implies x_{max} = ?$

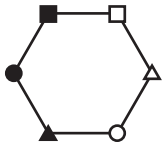
A) 7 B) 9 C) 11 D) 13 E) 15

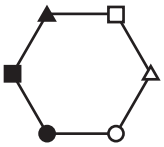
41.

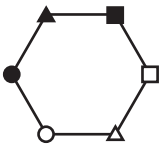


A) 

B) 

C) 

D) 

E) 

42.

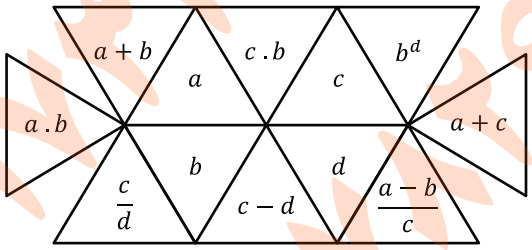
82	84	80	83	74	78	62	67	a	b

$\frac{a}{b} = ?$

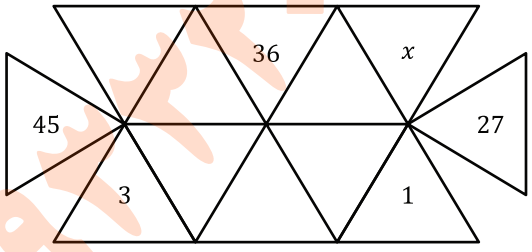
A) $\frac{2}{3}$ B) $\frac{9}{13}$ C) $\frac{5}{7}$ D) $\frac{3}{4}$ E) $\frac{7}{8}$

43.

I.



II.



$\implies x = ?$

A) 16 B) 25 C) 36 D) 64 E) 81