

« »-2012-2013

1.  $130\%$  :  $30\%$ ,  $20\%$ ,  
:  $100\% - 130\%$ ,  $80\% - x\%$ .
2.  $30^0$ ,  $2$  : , -
3. :  $3\sqrt{6} = \sqrt{3^2 \cdot 6} = \sqrt{54}$ ,  $\sqrt[4]{3600} = \sqrt[4]{60^2} = \sqrt{60}$ .
4. :  $a_1 = 15, d =$   
 $15, a_n = 3 \cdot 60 + 45 = 1845$  (  $a_n = a_1 + (n - 1)d$  ).  
и n. Д  $a_n = a_1 + (n - 1)d$ .
5. :  $\frac{c^2+25}{(c-5)(c+5)} - \frac{c^{(c-5)}}{c+5} = \frac{c^2+25-c^2+5c}{(c-5)(c+5)} = \frac{5(c+5)}{(c-5)(c+5)} = \frac{5}{c-5}$ .
6. :  $2 \sin\left(x + \frac{\pi}{2}\right) \cos\left(x + \frac{\pi}{2}\right) = \sqrt{3}$ .  
 $\sin\left(2\left(x + \frac{\pi}{2}\right)\right) = \sqrt{3}$ .  $\sqrt{3} > 1$ .
7. 1. , .
8. : 1) ; 2) « » ; 3) 20% , 2 20 - 10% - « » 15 , ; 4) 15% - - ; 5) - 26,875% - ; 5)
9. : :  $x^2 - x - 2 \leq 0$ ,  
 $x_1 = -1, x_2 = 2$ . « »  
( «-»).
10. :  $36\pi = \pi R^2 \Rightarrow R = 6$ . 8,  
:  $\pi Rl = 60\pi$ . 10.
11. :  
: (1; 1), (2; 2).
12. : 12, :  $4x - 20 +$   
 $4 - 2x = 4 + 5x. x = -\frac{20}{3} = -6\frac{2}{3}$ .
13. :  $\frac{k^2-1}{3} = \frac{k+1}{-1} = \frac{3}{3} = 1$ .  
 $k = -2$ .
14. :  
 $S = \frac{1}{2}absiny$ . :  $S_{MBK} = \frac{1}{2}MB \cdot BK \cdot \sin\angle B = \frac{1}{2} \cdot \frac{1}{2}AB \cdot \frac{1}{3}BC \cdot \sin\angle B = \frac{1}{6}$ .

$$\frac{1}{2}AB \cdot BC \cdot \sin \angle B = \frac{1}{6}S_{ABC}, \quad \Delta ABC \quad 6$$

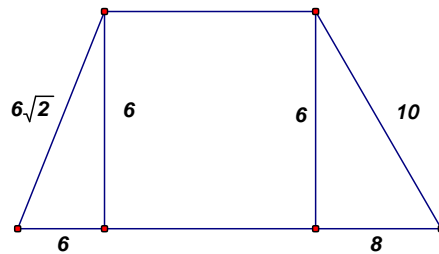
$\Delta MBK.$

15.  $\begin{cases} x - 3 \geq 0 \\ x^2 - 9 \neq 0 \end{cases} : \begin{cases} x \geq 3 \\ x \neq \pm 3 \end{cases} \Rightarrow x > 3.$

16. (

17.  $2: 2^{-(x-3)} = 2^{-2\frac{2x-4}{3}}$   
 $: 3 - x = \frac{8-4x}{3} \quad x = -1.$

18. 6.



19.  $: 2x + 14 = 10 + 6\sqrt{2}$   
 $: V = \frac{1}{3}Sh, \quad : S -$   
 $: S = 27\sqrt{3}.$

$: S = a^2 \frac{\sqrt{3}}{4},$

$a = 6\sqrt{3}.$

$: r = \frac{a\sqrt{3}}{6} = 3.$

5.

20.  $f(x)g(x) = 0 \quad \begin{cases} f(x) > 0 \\ g(x) > 0 \\ f(x) < 0 \\ g(x) < 0 \\ f(x) = 0 \\ g(x) = 0 \end{cases}$

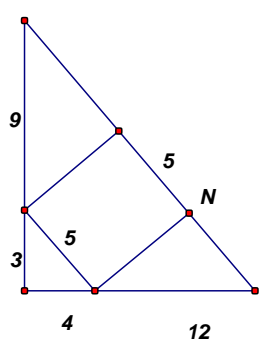
$\{0\} \cup [2; 4].$   $0.$   $:(- ; -2]$

21. 1 - , 2 - , 3 - , 4 - . : 1 - ,  
 :  $\sin\left(\frac{3\pi}{2} + x\right) = -\cos x$ ; 2 - ; 3 - ,  
 4  $Ox$ , 4  $Oy$ , 4; 4 -  
 , 4.

22. 1 - , 2 - , 3 - , 4 - . :  
 1  $\frac{\log_a 12 + \log_a 3}{\log_a 12} + \log_{12} 4 = \frac{\log_a 36}{\log_a 12} + \log_{12} 4 = \log_{12} 36 + \log_{12} 4 = \log_{12} 144 = 2$ .  
 2  $ctg^2 \pi a (\sin^2 \pi a + \cos^2 \pi a) + 1 = ctg^2 \pi a + 1 = \frac{1}{\sin^2 \pi a} = \frac{1}{\sin^2 \frac{\pi}{2}} = 1$ .  
 3  $\left(\frac{1}{a^2-9} - \frac{1}{a^2-6a+9}\right) \cdot \frac{a(a-3)^2}{6} + \frac{9}{a^2+3a} = \left(\frac{a-3-a-3}{(a-3)^2(a+3)}\right) \cdot \frac{a(a-3)^2}{6} + \frac{9}{a^2+3a} = \frac{-a}{a+3} + \frac{9}{a(a+3)} = \frac{9-a^2}{a(a+3)} = \frac{3-a}{a} = \frac{2,5}{0,5} = 5$ .

4  $1 - 4a + 4a^2 - \sqrt{9a^2 - 24a + 16} = |1 - 2a| - |3a - 4| = |0| - |-2,5| = -2,5$   
 23. 1 - , 2 - , 3 - , 4 - . :  $B$   $xOy$ ;  $K$   
 ,  $Oy, Oz$  1;  $D -$  1;  $C_1$   
 , (2; 0; 2), ,

24. 1 - , 2 - , 3 - , 4 - . :



$CKM$   $6^2$ ,  $ABC$   $96^2$ ,  
 $MKAB$  ( $KM, AB$ )  
 $96 - 6 = 90 \text{ cm}^2$ .

$S = \frac{a+b}{2} h$ , :  $KH = MN = 7,2$  .  
 25. 22. :  $NB, AH$  .  
 $x -$  ,  $y -$  ,  
 1 . :  $\begin{cases} 6x + y = 60 \\ 2x + 2y = 60 \end{cases}$   
 $x = 6, y = 24$ . 7 , 7

5 , 300 .  
 $7 \cdot 24 = 168$  .  
 $300 - 168 = 132$  . 6 ,  
 $132 : 6 = 22$ .

26. 0,5. :  
 0,5, 0,25, - 0,75, 4 .  
 , , :  $0,5 \cdot 0,75$ ,  
 , :  $0,5 \cdot 0,25$ .

27. 2. 
$$\left\{ \begin{matrix} \log_3(2x-1) > 2 \\ \sqrt{2x-5} < \frac{2}{3x-12} \end{matrix} \right\} \Leftrightarrow \left\{ \begin{matrix} 0 < 2x-1 < 9 \\ 2x-5 < \frac{2}{3x-12} < 0 \end{matrix} \right\} \Leftrightarrow \left\{ \begin{matrix} 0,5 < x < 5 \\ 4 < x < 7 \end{matrix} \right\}$$

28. 4. 
$$x_1 = 1 - b, x_2 = 0, \quad b > 0$$

$$\int_{1-b}^0 (-x^2 + (1-b)x) dx = 4,5$$

29. 24. 
$$(1-b)^3 = -27$$

30. 9. 
$$DM = \frac{AB}{49-16} = \frac{AB}{33}$$

$$CM = \frac{8\sqrt{3}}{2} = 4\sqrt{3}$$

31. -0,96. 
$$tg\alpha = -\frac{3}{4}, \quad 1 + tg^2\alpha = \frac{1}{\cos^2\alpha} = \frac{25}{16}, \quad \cos\alpha = \pm\frac{4}{5}$$

$$\sin\alpha = \pm\frac{3}{5}, \quad \sin 2\alpha = 2\sin\alpha\cos\alpha = \pm 0,96$$

32. 0,25. 
$$\frac{(\sqrt{2})^{1,6} \cdot 4^{-3,2}}{(0,25)^{1,8}} = \frac{2^{\frac{1,6}{2}} \cdot 2^{2 \cdot (-3,2)}}{(\frac{1}{4})^{1,8}} = \frac{2^{0,8} \cdot 2^{-6,4}}{2^{-3,6}} = 2^{-2} = \frac{1}{4} = 0,25$$

33. 100. 
$$x - 3 = \sqrt{x+a}$$

$$7x + (9-a) = 0$$

$$a > -\frac{13}{4} = -3,25$$

$$\begin{cases} x_{1,2} < 3 \\ x_{1,2} > -a \end{cases}$$

$$\left\{ \begin{matrix} \frac{7-\sqrt{13+4a}}{2} > -a \\ \frac{7+\sqrt{13+4a}}{2} > -2a \end{matrix} \right\}$$

$$\left\{ \begin{matrix} \sqrt{13+4a} < 7+2a \\ 13+4a < 49+28a+4a^2 \\ 7+2a > 0 \end{matrix} \right\}$$

$$a^2 + 6a + 9 > 0 \Leftrightarrow \begin{cases} a > -3,5 \\ a < -3 \end{cases}$$

$$-3,25 < a < -3$$