11 класс

1. $$3\sqrt{4^x - 2^{x+2} + 4} = 3 \cdot 2^{x+2} - 4^x - 2.$$

$$2$$

$$3\sqrt{2^2 \ -4\cdot 2\ +4} = 6\cdot 2\ -2^2\ -2.$$

$$: \quad 2\ = t, \ \left(t > 0\right).$$

$$: 3\sqrt{t^2 - 4t + 4} = -t^2 + 6t - 2.$$

$$:3\sqrt{\left(t-2\right)^2} = -t^2 + 6t - 2,$$

$$3\cdot \left|t - 2\right| = -t^2 + 6t - 2.$$

$$($$

$$)\ (\qquad .\qquad\quad).$$

, $$t = 1 \qquad t = 4.$$

$$:\ 2\ = 4,\ \ = 2\quad 2\ = 1,\ \ = 0.$$

$$: 0\quad 2.$$
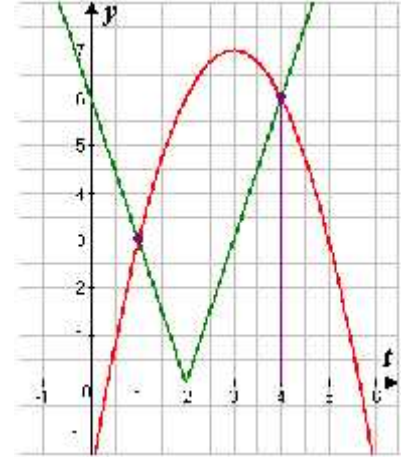
2. , **12008** ,
, **19.**

. $: 12008$ $19,$ $, 12008 = 19 \cdot 632.$

. , $19,$

$19.$,

$19.$:

$$1203\underset{k}{\ldots}308\ -\ 1203\underset{k-1}{\ldots}308\ =\ 1083 \cdot 10^k.$$

$$19, \qquad 1083 = 19 \cdot 57.$$

3. $$\cos^4 2x - 2(a+2)\cos^2 2x - (2a+5) = 0$$

?

. $$\cos^2 2x = t, \ \ t \in [0;1],$$:

$$t^2 - 2(a+2)t - (2a+5) = 0.$$ $t:$

$$t_{1,2} = \frac{2(a+2) \pm \sqrt{4(a+2)^2 + 4(2a+5)}}{2} = \frac{2a+4 \pm 2(a+3)}{2}; \ \ t_1 = -1, \ \ t_2 = 2a+5.$$

, $$t = -1\ \notin [0;1].$$

,

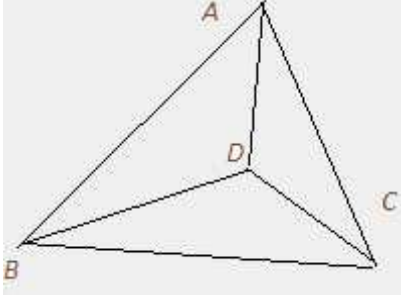$$t_2 \in [0;1], \qquad 0 \le 2a+5 \le 1 \ \Leftrightarrow\ -2,5 \le a \le -2.$$

$$: \ \in [-2,5; -2].$$

4.   ,   ,

?

.   ,   *ABCD*   .

                             .   , $= \ = AD,$,

      , *BD*   *CD*   *BCD –*   ),

    ABC, ABD, ACD   .

             ,   —   ,

                     .   , $= \quad DB = DC,$

    ADB   *ADC*   .

         ,   .

         , $= \ = \ ,$,   ,

                        .

, $= \ ,$ $= BD.$,   *AD*   , $AD = BD.$, $DC = \ .$

       ,   *ABC*   *ACD*   .   ,   .

:   ,   .

5.   **2015 × 2015**   .   ,

                   ,   .

                   ?

   . 2015×2015

    (.   ).   ,   «   »

                       .

        ,   «   »   .

                  3   3   (.

). $2015 : 3 = 671$ (. 2).

           –   ,   .
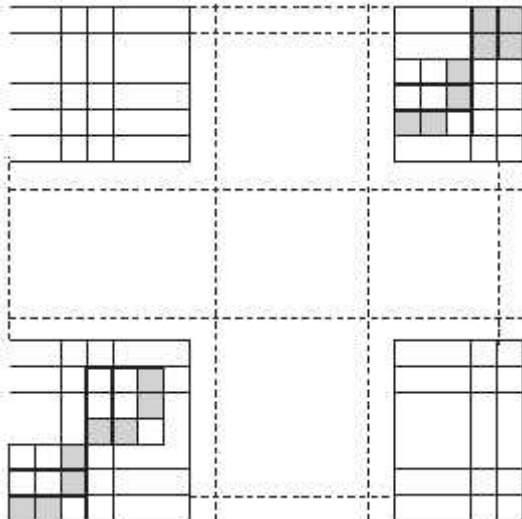
671   ,   671·2
                                                      2013 × 2013.   2 × 2,
              ,   .   ,   671·2 +
2 = 1344   .
        : 1344   .