



**THIRD NATIONAL STUDENT OLYMPIAD  
IN COMPUTER MATHEMATICS  
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SOFIA UNIVERSITY ST. KLIMENT OHRIDSKI  
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**Answers for group B**

1.  $x^4 + 16x^3 + 78x^2 + 115x + 50$

2.  $x^3 - 2x^2 - 3x + 7$

3.  $a = -55$  и  $b = 125$

4.  $a = 2, x = 1, y = 3, z = 5$  or

$a = -\frac{9}{5}, x = \frac{25}{6}, y = -\frac{10}{3}, z = -\frac{65}{6}$

5.  $a = 2$  or  $a = -\frac{3}{2}$

6. To check.

7.  $C(-2012, 4026)$  or  $C\left(\frac{2024}{3}, \frac{4018}{3}\right)$

8.  $\frac{44}{15}$

9. 1634, 8208, 9474

10.  $\frac{\sqrt{3}}{3}$

11. To check.

12. They are equal.

13.  $x_1 = 2.696256563, x_2 = 7.328347779,$   
 $x_3 = 8.263829735$

14.  $\int_0^{2014} e^{-x} \left(1 + \frac{x}{1!} + \frac{x^2}{2!} + \dots + \frac{x^{2014}}{2014!}\right) dx < 2014$

15.  $m \in \left[\frac{4}{9}, 1\right) \cup (1, 4]$

16.  $M(2, -2)$

17.  $M(3, -2, 5)$

18.  $\max_{x \in \left(0, \frac{\pi}{2}\right)} y(x) = y\left(\frac{\pi}{4}\right) = 1$

19.  $a = 3994, b = -4055916, y_{\max}(2014)$

20.  $x \in (1, +\infty)$

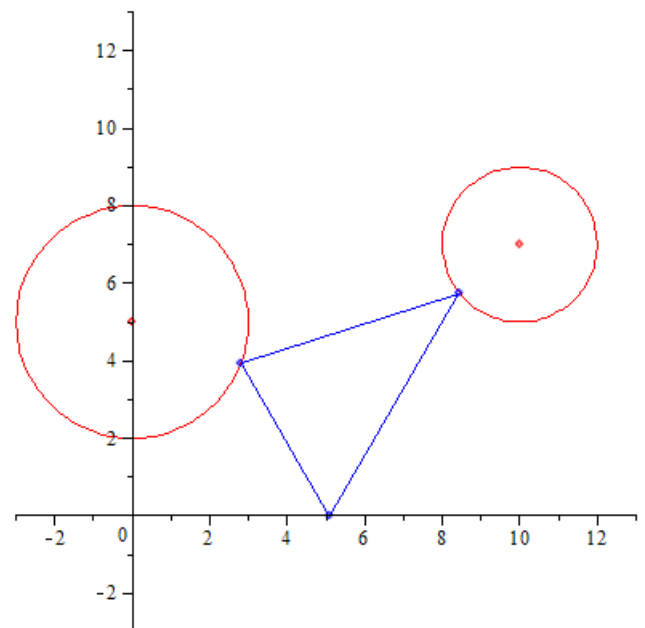
21.  $\sqrt{e}$

22.  $x(y')^2 - 2y \cdot y' = x$

23.  $\frac{16}{3}$

24.  $A(2.80, 3.93), B(8.44, 5.75), C(5.09, 0)$

$AB + BC + AC = 17.12$



25.  $L = 6, S = \frac{3}{8}\pi$

26. 2

27.  $\frac{\pi}{3} - \sqrt{3} + 1$

28.  $D(3.543776458, -2.821817673)$

29.  $\frac{88}{105}$

30. To check.