

**A collection of problems presented by users from 56 countries and solved
by UMS**

! - difficult

!! - more difficult

!!! - most difficult

1. Analysis of the function including graphs (Argentina) $y = -x(x-3)^2(x+5)^3$

2. Analysis of the function including graphs (Argentina) $f(x) = 3x^4 - 4x^3 - 36x^2 + 3$

3. Equation with parameters (Argentina) $\frac{x-b}{a} - \frac{x+a}{b} = \frac{b^2-a^2}{ab}$

4. Simultaneous equations (Argentina)

$$\left\{ \begin{array}{l} 80-bx=0 \\ 1-by=0 \\ 19+a-bz=0 \\ x+y+z=1 \\ s+t+u=1 \\ m+p=1 \\ \frac{s}{u}=1.4 \\ m=n+o \\ \frac{o}{p}=1.4 \\ \frac{o+p}{n}=0.06 \\ bx-sc-md=0 \\ by-tc=0 \\ bz-uc-pd=0 \\ md-e=0 \\ pd-f=0 \end{array} \right.$$

5. Complete factoring (Australia) $64m^2-512m^3-81n^2+729n^3$

6. Radical simplification and so on (Belgium) $3\sqrt{108}-5\sqrt{\frac{3}{25}-\frac{1}{2}}\sqrt{12}$

7. Analysis of the function including graphs (Belgium) $f(x) = \frac{3x^2-5x+1}{2x+1}$

8 Equation (Belgium)!

$$\frac{1}{x-1} + \frac{1}{x+1} + \frac{1}{x+4} + \frac{1}{x+6} = \frac{1}{x} + \frac{1}{x+2} + \frac{1}{x+3} + \frac{1}{x+5}$$

9. Equation with parameters (Belgium) !!

$$\sqrt{x^2 - ax + a^2} + \sqrt{x^2 - bx + b^2} = \sqrt{a^2 + ab + b^2}$$

10. Simultaneous equations (Belgium)

$$\left\{ \begin{array}{l} x + (x+y) + (x+2y) + (x+3y) + (x+4y) = 45 \\ \frac{1}{x} + \frac{1}{x+y} + \frac{1}{x+2y} + \frac{1}{x+3y} + \frac{1}{x+4y} = \frac{137}{180} \end{array} \right|$$

11. Equation (Belgium) $\log_2(2^x - 1) + x = \log_4(144)$

12. Radical simplification and so on (Belorussia)!
$$\frac{z^{\frac{1}{5}} \left(\sqrt[5]{z^4} - \sqrt[5]{z^{-1}} \right)}{z^{\frac{2}{3}} \left(\sqrt[3]{z} - \sqrt[3]{z^{-2}} \right)}$$

13. Simultaneous equations with parameters (Belorussia)!
$$\left\{ \begin{array}{l} x + y + 2z = \frac{3}{2} \\ \frac{4}{5}xy - z^2 + 2z = \frac{5}{4} \end{array} \right|$$

14. Simplification (Bosnia and Herzegovina)

$$\left(\frac{a^{-1} + b^{-1}}{a^{-2} - b^{-2}} \right)^{-2} : \left(\frac{a^{-2} + b^{-2}}{a^{-4} - b^{-4}} \right)^{-2}$$

15. Analysis of the function including graphs (Bosnia and Herzegovina) $f(x) = \frac{x^2 + x + 1}{x - 1}$

16. Inequality (Brazil) $\sqrt{2x-3} + \sqrt{x-60} < \sqrt{15x-4}$

17. Simultaneous equations with parameters (Brazil) $\left\{ \begin{array}{l} x+2y-z=4 \\ 3x-y+z=9 \\ 4x+y+mz=13 \end{array} \right. |$

18. Analysis of the function including graphs (Brazil) $f(x) = \frac{1}{x} + 4x$

19. Simultaneous equations (Bulgaria) $\left\{ \begin{array}{l} y^2 + 2y - x = 0 \\ x^2 - 4xy + 5y^2 - 2 = 0 \end{array} \right. |$

20. Simultaneous equations (Bulgaria) $\left\{ \begin{array}{l} x^2 + y^2 - 2x = 3 \\ 2x^2 + 2y^2 - 3y = 4 \end{array} \right. |$

21. Equation (Bulgaria) $\frac{2x}{2x^2-5x+3} + \frac{13x}{2x^2+x+3} = 6$

22. Equation (Bulgaria)! $9^x - 2^{x+\frac{1}{2}} = 2^{x+\frac{7}{2}} - 3^{2x-1}$

23. Equation with parameters (Canada) $\frac{2x}{m+1} - \frac{2m-6}{m-1} = \frac{x}{m-1}$

24. Radical simplification and so on (Canada)

$$\sqrt{28} - \sqrt{27} + \sqrt{63} + \sqrt{300} - \sqrt{147}$$

25. Radical simplification (Chile) $\sqrt{16-2\sqrt{20-2\sqrt{28+2\sqrt{35}}}}$

26. Equation (Colombia) $\sqrt{6}x^2 + 2x - \frac{\sqrt{6}}{2} = 0$

27. Simplification (Colombia) $\frac{\frac{s^2}{s-t} - s}{\frac{t^2}{s-t} + t}$

28. Equation (Costa Rica) $\sqrt{x+3} + \sqrt{2-x} - \sqrt{10-x} = 0$

29. Analysis of the function including graphs (Croatia)! $f(x) = x^4 - x^3 - 8x^2 + 12x$

30. Equation (Croatia) $9x^4 - x^2 - 2x - 1 = 0$

31. Analysis of the function including graphs (Czechia) $f(x) = \frac{x^2 + 3x + 5}{x + 1}$

32. Radical simplification (Czechia) $\frac{\sqrt[3]{5}\sqrt[4]{25}}{\sqrt{5}\sqrt[3]{25}} \cdot \sqrt[3]{25}$

33. Equation (Dominican Republic) $(\sqrt{x}-1)^2 - 7(\sqrt{x}-1) + 10 = 0$

34. Equation (Ecuador) $\sqrt{2x-3} - \sqrt{x+7} + 2 = 0$

35. Simultaneous equations (Estonia) $\begin{cases} x^2 + xy + y^2 + 3x + 3y = 0 \\ x^2y + x^2 - y^2 - xy^2 = 9 \end{cases}$

36. Radical simplification and so on (Estonia) $9\sqrt{6} + 12\sqrt{\frac{2}{3}} - 24\sqrt{\frac{3}{2}}$

37. Equation (Estonia) $\frac{(x + \sqrt{3x-2})^2}{x^2 - 3x + 2} = 5$

38. Simultaneous equations (Estonia) $\left\{ \begin{array}{l} x+y = \frac{6+5k}{k^2+k-2} \\ xy = \frac{12}{k^2+k-2} \\ y=3x \end{array} \right. |$

39. Equation (Estonia) $\sqrt{1-\sqrt{x^4-x^2}} = x-1$

40. Simultaneous equations (Estonia) !! $\left\{ \begin{array}{l} x^2 + y^2 + xy - 3x + 3 = 0 \\ x^3 + x^2y - xy^2 + y^3 = 1 \end{array} \right. |$

41. Simultaneous equations (Estonia) $\left\{ \begin{array}{l} 6x^2 - 59x + 149 = b^2 \\ a - b = |x - 5| \\ b^2 - a^2 = 5(x - 5)^2 \end{array} \right. |$

42. Equation with parameters (Estonia) !

$$\frac{(k+2)x^2}{(k+1)(x-2)} - \frac{2kx}{(k-1)(x-2)} = \frac{5}{k^2-1} + \frac{12-k^2-k}{(k^2-1)(x-2)}$$

43. Equation (France) $x^4 = (x+1)(5x^2-6x-6)$

44. Radical simplification (France) $\frac{2\sqrt{10}+4-2\sqrt{2}}{\sqrt{5}+\sqrt{2}-1}$

45. Analysis of the function including graphs (France) $f(x) = \frac{x^3}{(x-1)^2}$

46. Analysis of the function including graphs (France) $f(x) = \frac{3+x^2}{x-1}$

47. Analysis of the function including graphs (France) $f(x) = \frac{1}{20}x^3 - \frac{1}{5}x^2 + \frac{1}{4}x$

48. Simultaneous equations (Georgia) $\left\{ \begin{array}{l} 3a-4b=11 \\ a+b=\frac{1-2m}{2} \\ ab=\frac{m-1}{2} \end{array} \right. \Bigg|$

49. Simultaneous equations with parameters (Georgia) $\left\{ \begin{array}{l} ax+2y=-1 \\ 10x-6y=b+3 \end{array} \right. \Bigg|$

50. Equation with parameters (Georgia) $\frac{|x-2|}{x-2} = |x+a|$

51. Analysis of the function including graphs (Georgia) $f(x) = \frac{x^3 + 8}{3x^2 + 5x - 2}$

52. Equation (Germany) $\frac{3x}{x(x-2)} + x + 1 = \frac{7-2x}{x-2}$

53. Analysis of the function including graphs (Germany)!! $f(x) = -7x^5 + 3x^2 + 4$

54. Analysis of the function including graphs (Germany) $y = x^3 (x^2 - 10x + 25)$

55. Equation (Germany) $x^4 - 21x^3 + 126x^2 - 294x + 196 = 0$

56. Analysis of the function including graphs (Germany) $f(x) = -2x^3 + 3x^2 + 12x - 13$

57. Analysis of the function including graphs (Germany) $f(x) = \frac{3x^2 - 9}{x - 2}$

58. Inequality (Germany) $(x^2 - 4)(x - 4)^2 \leq 0$

58. Analysis of the function including graphs (Germany) $f(x) = (2 - 3x + x^2)^3$

59. Equation (Germany) $\frac{3(x-2)}{x+2} - \frac{1}{x} = \left[\frac{3x^2-7x-2}{x(x+2)} \right]^2$

60. Equation with parameters (Germany)

$$\frac{(2x+6a)(x+9b)-2a^2}{(3b+x)(x-a)} = \frac{2b+6x}{x-a} - \frac{8x-4a}{6b+2x}$$

61. Equation with parameters (Greece) $x^4 + 4abx^2 + (a^2 + b^2)^2 = 0$

62. Equation (Greece) $\sqrt{x+3} + \sqrt{x} = 3$

63. Complete factoring (Greece) $x^2 + 7x + xy + 12 + 4y$

64. Radical simplification and so on (Greece) $\sqrt{6\sqrt{12}\sqrt{3}\sqrt{9}}$

65. Radical simplification (Holland) $\frac{2\sqrt{45}}{4\sqrt{5-\sqrt{20}}}$

66. Analysis of the function including graphs (Iceland) $f(x) = x^4 - 8x^2$

67. Equation with parameters (India) $\frac{x}{x-a} + \frac{x}{x-b} = 2$

68. Equation with parameters (India) $\frac{m(x-a)}{x+a} + \frac{n(x-b)}{x+b} = m+n$

69. Equation (India) $\sqrt{x^2+6x-7} + \sqrt{3x^2+6x-9} = \sqrt{5x^2+50x-55}$

70. Equation (Indonesia) $x^3 + \frac{1}{x^3} = 52$

71. Equation (Israel) $\log_4(x) - \log_2\left(\frac{x}{8}\right) = 1$

72. Equation (Israel) $\log_{25}(2x^2 - 5x + 4) \cdot \log_x(5) = 1$

73. Equation (Israel) $108x^5 - 27x^3 - 32x^2 + 8 = 0$

74. Equation (Israel) $\log_{3x}(9) + 2 = 2 \log_{81}(9x)$

75. Simultaneous equations (Israel) $\begin{cases} x+y=4 \\ y^2+2x+z=13 \\ z+y+x^3=6 \end{cases}$

76. Simultaneous equations (Israel) $\begin{cases} 3^x - 5^y = 4 \\ 3^{x+1} \cdot 3^{y-1} = 27 \end{cases}$

77. Equation (Israel) $\sqrt{1 - \log_3(x)} \cdot \log_x(3) = \frac{2}{3}$

78. Inequality (Israel) $\log_x(|x^2 - 4|) < 0$

79. Complex numbers (Israel) $(x + 2i)(6 + 2i) = 4 + 3i$

80. Equation with parameters (Israel) $\frac{ax+10}{x^2-9} = \frac{5}{x-3} + \frac{a}{x+3}$

81. Simultaneous equations with parameters (Israel) $\begin{cases} 4x-y=1 \\ (m^2+4)x+my=2 \end{cases}$

82. Equation (Israel) $\frac{2x^3-2x}{x^2+x} = x^3 - x^2 - 2$

83. Inequality (Israel) $0 < \frac{x^2-4x+4}{x^2-x-6} < \frac{2}{3}$

84. Analysis of the function including graphs (Israel) $y(x) = 8x^3 - 3x^4 - 6x^2$

85. Simultaneous equations (Israel) $\left\{ \begin{array}{l} \lg(x^2 + y^2) - 1 = \lg(13) \\ \lg(x+y) - \lg(x-y) = 3\lg(2) \end{array} \right. |$

86. Analysis of the function including graphs (Israel)! $y(x) = \frac{x^2 - 3x}{x^2 + 3}$

87. Simultaneous equations (Israel)! $\left\{ \begin{array}{l} \log_x(2) = \log_y(4) \\ 3x^2 - 2y^2 + 20 = 0 \end{array} \right. |$

88. Equation with parameters (Israel) $x - \frac{1}{x} = \frac{a}{b} - \frac{b}{a}$

89. Equation with parameters (Israel) $\frac{px+3}{2} + \frac{p}{x} = p^2 + 2$

90. Equation with parameters (Israel) $1 = \frac{1}{\left[\frac{(b+1)x+b}{x+1} + 1 \right]^2}$

91. Inequality (Israel) $1 < \frac{2x^2 - 10x + 14}{x^2 - 7x + 12} \leq 2$

92. Simultaneous equations (Israel) $\left\{ \begin{array}{l} 5|x-y| - 2y = 3 \\ 5|x+y| = 9 \end{array} \right. |$

93. Equation (Israel) $\log_{2x}(x^3) + \log_2(x) = 4$

94. Simultaneous equations (Israel) $\left\{ \begin{array}{l} \frac{5xy}{2x^2 + 5x - 12} = \frac{3y-12}{2x-3} + \frac{y-4}{x+4} \\ (x+2)(y-4) = x(y+5) \end{array} \right. |$

95. Equation (Israel) $1 + \frac{2 \log_4(10-x)}{\log_2(x)} = \frac{2}{\log_4(x)}$

96. Equation with parameters (Israel)! $\frac{x + \frac{1}{x}}{1 - \frac{1}{a+x}} = \frac{a + \frac{1}{a}}{1 - \frac{1}{a+x}}$

97. Inequality (Israel) $\sqrt{\log_3((1-x)(3-2x))} < 1$

98. Simultaneous equations (Israel) $\left\{ \begin{array}{l} \frac{-2x+3}{3x+6} \geq -3 \\ \frac{x-5}{x^2-6x+10} > -\frac{1}{2} \end{array} \right|$

99. Equation (Israel) $\log_{\sqrt{2}}\left(\frac{7-3x}{x+6}\right) - \log_{\frac{1}{\sqrt{2}}}(x+6) = -\log_{\frac{1}{2}}(4)$

100. Inequality (Israel) $\log_x(3) < \log_{x+2}(9)$

101. Equation with parameters (Israel) $\frac{3(x+2)}{b} - \frac{2(3x-1)}{a} = \frac{x(a-2b)}{ab}$

102. Equation with parameters (Israel) $mx(mx+1) = 2x(2x+1)$

103. Equation (Israel) $3(x^2+4x)^2 - 2(x+2)^2 = 57$

104. Equation with parameters (Israel) $\frac{3}{x^2-8x+16} = \frac{2a}{x^2-x-12}$

105. Inequality (Israel) $|x^2-1| < x^2 - |x| + 1$

106. Equation (Israel)! $x^3 + 2007x + 2008 = 0$

107. Simultaneous equations (Israel) $\left\{ \begin{array}{l} a+d-2 = (a-1) \cdot q \\ a+2d-2 = (a-1) \cdot q^2 \\ a+3d = (a-1) \cdot q^3 \end{array} \right|$

108. Analysis of the function including graphs (Israel) $y = \frac{x^2}{(x-1)(x+3)}$

109. Simultaneous equations with parameters (Israel) $\left\{ \begin{array}{l} x^2 + y^2 = 8a^2 + 2 \\ xy = 4a^2 - 1 \end{array} \right|$

110. Simultaneous equations (Israel)! $\left\{ \begin{array}{l} x+xy=5 \\ xy = \frac{xy^2}{1-y} + \frac{2}{3} \end{array} \right|$

111. Radical simplification and so on (Israel) $50 \frac{1}{2} - \frac{\log_9(\sqrt{3})}{\log_4(50)}$

112. Simultaneous equations (Israel)! $\left\{ \begin{array}{l} (2\sqrt{2})^{4x + \frac{y}{2} - 5} = \sqrt[3]{4^{2x}} \cdot 2^{\frac{y}{2} + 2} \\ 27 \cdot \left[\frac{1}{\sqrt{3}} \right]^{\frac{y}{2} - 2x} = \sqrt[5]{3^{10x - \frac{y}{2}}} \end{array} \right|$

113. Equation (Israel) $\log_3 \left(\frac{3^x + 1}{4} \right) = 1 - x$

114. Equation (Israel) $\sqrt{2^x \sqrt[3]{4^x \cdot 0.25 \frac{1}{x}}} = 4 \sqrt[3]{2}$

115. Equation with parameters (Italy) $\frac{6-4a}{1-3x} = \frac{a}{2+3x}$

116. Equation with parameters (Italy)

$$\frac{a^2 bx}{b^2 - a^2} - \frac{2x^2 - 1}{a - b} = \frac{abx}{a + b} - \frac{x^2}{a} - \frac{x^2(a + b)}{a^2 - ab}$$

117. Simultaneous equations (Italy) $\begin{cases} 2xy + y^2 = 15 \\ |x - y| = 6 \end{cases}$

118. Equation with parameters (Italy) $\frac{a^2 - x^2}{2a - 4} + \frac{(a + 2)x}{2a} = \frac{(a^2 - x^2)(a + 2)}{2a^2 - 4a}$

119. Equation (Italy) $\frac{4\sqrt{6x+1}}{\sqrt{2}} - (2x + \sqrt{3})^2 = \frac{1 - 7\sqrt{2x}}{\sqrt{2}}$

120. Equation with parameters (Italy) $x^5 - ax^4 + 2x^3 - 2ax^2 - 3x + 3a = 0$

121. System of inequalities (Italy) $\begin{cases} x^2 + 3x > 4 \\ x(x + 1) - 6x + 6 > 0 \end{cases}$

122. Equation (Italy)
$$\frac{\frac{3+x}{x-3}}{\frac{x+3}{x}} + \frac{(x+1)^2}{x^2+3x+9} = \frac{\frac{x+1}{x^3-27}}{\frac{1}{2x^2}}$$

123. Equation (Italy)
$$\sqrt{x+2} + \sqrt{2x+1} = 2\sqrt{\frac{3}{4}x + \frac{3}{4}}$$

124. Simultaneous equations with parameters (Italy)
$$\begin{cases} ax+cx-by=bc \\ x+y=a+b \end{cases}$$

125. Equation with parameters (Italy)

$$x-1 + \frac{2(ax+1)}{1-3a} = \frac{a+1}{2} \cdot \left(\frac{1}{a+1} - \frac{1}{a-1} \right)$$

126. Simultaneous equations (Japan)
$$\begin{cases} x-y=4 \\ \log_2(x+y) + \log_2(x-y) = 3 \end{cases}$$

127. Equation (Japan)
$$-x^3 + x^2 + 4x - 4 = 0$$

128. Inequality (Kazakhstan)
$$\sqrt{x^2-9x+20} \leq \sqrt{x-1} - \sqrt{x^2-13}$$

129. Analysis of the function including graphs (Kazakhstan)
$$y(x) = 1 - 6x - 6x^2 - 2x^3$$

130. Simultaneous equations (Kazakhstan)
$$\begin{cases} 2x^2 + y - z = -1 \\ z + y - 2x = 1 \\ x^4 + zy - y = 1 \end{cases}$$

131. Simultaneous equations (Kazakhstan)!
$$\begin{cases} x + xy + xy^2 = 6 \\ x^2 + x^2y^2 + x^2y^4 = 12 \end{cases}$$

132. Equation with parameters (Latvia) $\frac{5-x}{x-2} = \frac{a}{x-2} + b$

133. Radical simplification (Lithuania) $\sqrt[5]{48} \cdot \sqrt[5]{162}$

134. Complete factoring (Lithuania) $(x+y+z)(xy+yz+xz)-xyz$

135. Equation (Lithuania) $\frac{3x^2+x-52}{x^2-3x-4} - 4 = \frac{x+11}{x^2-1}$

136. Radical simplification and so on (Lithuania) $\sqrt[4]{(3-2\sqrt{2})^2} - \sqrt[4]{4}$

137. Analysis of the function including graphs (Malaysia) $y = \frac{x^2+x^3}{2}$

138. Equation (Malaysia) ! $x^5 - x^3 + x + 1 = 0$

139. Analysis of the function including graphs (Mexico) $f(x) = \frac{x+1}{x+2} \cdot (x-3)$

140. Equation with parameters (Mexico) $x^2 + y^2 + 14x - 6y = -58$

142. Analysis of the function including graphs (Mexico) $f(x) = \frac{1}{(4x^2 + 6x - 7)^3}$

143. Complete factoring (Mexico) $3x^3 + 2axy + 2ay^2 - 3xy^2 - 2ax^2 - 3x^2y$

144. Inequality (Mexico) $\frac{(x+3)^2(2-x)}{(x+4)(x^2-4)} \leq 0$

145. Inequality (Mexico) $4x > 2 - 5x \cdot |4x - 3|$

146. Equation (Moldavia) $\sqrt[3]{10-x} - \sqrt[3]{3-x} = 1$

147. Radical simplification and so on (Moldavia)! $\frac{\sqrt{2} + \sqrt{3} + \sqrt{4}}{\sqrt{2} + \sqrt{3} + \sqrt{6} + \sqrt{8} + 4}$

149. Equation with parameters (Moldavia) $\frac{x^2}{ab-2b^2} = \frac{a-b}{ac^2-2bc^2} + \frac{x}{bc}$

150. Radical simplification and so on (Moldavia) $\sqrt{(1-\sqrt{3})^2} - \sqrt[6]{27}$

151. Radical simplification and so on (Moldavia)! $\left[\frac{\sqrt[4]{15} + \sqrt[4]{45}}{\sqrt[4]{10} + \sqrt[4]{30}} \right]^4$

152. Radical simplification and so on (Moldavia)

$$\sqrt[3]{-5} \cdot \sqrt{8} \cdot \sqrt[3]{25} \sqrt{32} + \frac{\sqrt[5]{-729}}{\sqrt[5]{3}}$$

153. Inequality (Mongolian Republic) $(x-1)^3 (x-2) (2x-3) < (x-1)^3 (x-2)^2$

154. Equation with parameters (Mongolian Republic), find x $ax = |x|$

155. Simultaneous equations (Morocco) $\left\{ \begin{array}{l} \frac{x}{3} + \frac{2y}{4} = \frac{1}{6} \\ \frac{2x}{5} - \frac{y-1}{2} = \frac{3}{4} \end{array} \right|$

156. Equation (Morocco)! $\sqrt{x^2-4} - \sqrt{x-2} = x-2$

157. Equation with parameters (Pakistan) $\frac{a}{ax-1} + \frac{b}{bx-1} = a+b$

158. Analysis of the function including graphs (Peru) $y(x) = (2x^2 + 1)^3 (2x^3 - 1)^2$

159. Simultaneous equations (Philippines) $\begin{cases} x^2 - y^2 - 3x - y + 5 = 0 \\ 2x^2 + y^2 + y - 11 = 0 \end{cases}$

160. Equation (Poland) $x^4 - 2x^3 - 3x^2 + 4x + 1 = 0$

161. Equation with parameters (Poland)! $\frac{1}{2a+ax} - \frac{1}{2x-x^2} = \frac{2(a+3)}{x^3-4x}$

162. Simultaneous equations (Poland) $\begin{cases} a+d=14 \\ b+c=12 \\ \frac{b}{a} = \frac{c}{b} \\ c-b=d-c \end{cases}$

163. Equation (Puerto Rico) $x^4 - x^3 - 5x^2 - x - 6 = 0$

164. Analysis of the function including graphs (Puerto Rico) $f(x) = (x-3)(x^2+1)$

165. Inequality (Romania) $\left| \frac{x^2 - 5x + 4}{x^2 - 4} \right| \leq 1$

166. Equation (Romania)

$$2x^8 - 9x^7 + 20x^6 - 33x^5 + 46x^4 - 66x^3 + 80x^2 - 72x + 32 = 0$$

167. Inequality (Russia)

$$\left(\sqrt{x^2 - 5x + 6} + 2 \right) \cdot \sqrt{x - \frac{1}{x}} \cdot \left(\sqrt{10x - 2x^2 - 12} + 2 \right) \geq 0$$

168. Simultaneous equations with parameters (Russia) $\begin{cases} \frac{2y-x+2}{y+1} = \frac{1-y}{2-x} \\ y=2m-x-1 \end{cases}$

169. Equation (Russia) $(x - \sqrt{4-3x})(2x^2 - 4x + 2) = 8x - 8\sqrt{4-3x}$

$$170. \text{ Simultaneous equations (Russia) } \left\{ \begin{array}{l} b+c=10 \\ a+b+c+d=21 \\ 2b=a+c \\ c^2=bd \end{array} \right. \Bigg|$$

$$171. \text{ Equation (Russia) } \sqrt{x+1} = \sqrt{2x-1} + \sqrt[3]{x-2}$$

$$172. \text{ Radical simplification (Russia) } \frac{16+2\sqrt{39}}{\sqrt{13}+\sqrt{3}}$$

$$173. \text{ Simultaneous equations (Russia) } \left\{ \begin{array}{l} xy^2+x-y^2=21 \\ x^2y^2-y^4x=20 \end{array} \right. \Bigg|$$

$$174. \text{ Equation with parameters (Russia) } \sqrt{x+a-2} + \sqrt{x-3} = 3$$

$$175. \text{ Equation (Russia) } x^2 + 5x + 6 = \frac{15(x^2 + 3x + 6)}{x^2 + x}$$

$$176. \text{ Equation (Russia) } (x^2 - 6x - 9)^2 = x(x^2 - 4x - 9)$$

$$177. \text{ Equation with parameters (Russia) } \log_{x+ax} (ax^2 - |a|x) = 1$$

$$178. \text{ Equation with parameters (Russia) } \sqrt{x+1} - \sqrt{x-1} = a$$

$$179. \text{ Equation (Russia) } (x^2 - 1)(x^2 + 10x + 24) = 144$$

$$180. \text{ Simultaneous equations (Russia) } \left\{ \begin{array}{l} xy(x-1)(y-1) = 72 \\ (x+1)(y+1) = 20 \end{array} \right. \Bigg|$$

$$181. \text{ Equation (Russia) } \log_2 \left(\sqrt[3]{x} \right) + \sqrt[3]{\log_2(x)} = \frac{4}{3}$$

182. Equation with parameters (Russia) $\frac{2a-x}{x+a-3} + \frac{3x-2a}{x-a+1} = 4$

183. Inequality (Russia)

$$1 + \log_{(3x+1)^2} (25) \cdot \log_5 (11-3x) \geq \frac{5}{\log_2 (3x+1)}$$

184. Simultaneous equations (Russia) $\left\{ \begin{array}{l} x-2y+3z=9 \\ x^2+4y^2+9z^2=189 \\ 3xz=4y^2 \end{array} \right.$

185. Analysis of the function including graphs (Russia) $f(x) = \frac{x^3+4x}{2x^2-10}$

186. Radical simplification (Russia)! $\frac{(5\sqrt{3}+\sqrt{50})(5-\sqrt{24})}{\sqrt{75}-5\sqrt{2}}$

187. Equation (Russia)! $\frac{x+2}{2\sqrt{x+1}-3} = \frac{\sqrt{x+1}+1}{3} + 4$

188. Equation (Russia) !!! $\frac{x^2-1}{3} = x^3-59$

189. Equation with parameters (Russia) !! $\frac{x^2}{8a} + \frac{2x}{3} = \sqrt{\frac{x^3}{3a} + \frac{x^2}{4} - \frac{a}{2}}$

190. Simultaneous equations (Russia)! $\left\{ \begin{array}{l} x+y+z = \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{13}{3} \\ xyz=1 \end{array} \right. \Bigg|$

191. Inequality (Russia)! $\frac{x}{\sqrt{x-10} + \sqrt{x}} - \frac{x}{\sqrt{10-x} - \sqrt{x}} > \frac{2}{\sqrt{x}}$

192. Inequality (Russia)! $|\sqrt{10x+25} - x| \geq 5$

193. System of inequalities (Russia) $\left\{ \begin{array}{l} |a-2x-3| + |3-x-a| = 3 \\ 3x^2 - x + 2a - 6 \geq 0 \end{array} \right. \Bigg|$

194. Simultaneous equations (Russia)! $\left\{ \begin{array}{l} x+y+z=0 \\ x^2 + y^2 + z^2 = x^3 + y^3 + z^3 \\ xyz=2 \end{array} \right. \Bigg|$

195. Radical simplification (Russia)! $\left\{ \begin{array}{l} \sqrt{\frac{p(p-a)(p-b)(p-c)}{a+b+c}} \\ p = \frac{2}{2} \\ a = \sqrt{5} \\ b = \sqrt{10} \\ c = \sqrt{13} \end{array} \right. \Bigg|$

196. Simultaneous equations with parameters (Russia)! $\left\{ \begin{array}{l} a^2 - 2ax + x^2 - 2y - y^2 = 1 \\ |x+a| = y-1 \end{array} \right. \Bigg|$

197. System of inequalities (Russia)! $\left\{ \begin{array}{l} x^2 + 2x > 0 \\ |x+1| \leq 2 \\ \frac{1}{x^2} \leq 1 \end{array} \right. \Bigg|$

198. Analysis of the function including graphs (Russia)! $y(x) = 2 + 5x^3 - 3x^5$

199. Radical simplification and so on (Russia) $15\sqrt{\frac{3}{5}} - 0.5\sqrt{60} + 2\sqrt{3\frac{3}{4}}$

200. Equation (Russia)! $(x+1)^4 = 2(x^4 + 1)$

201. Radical simplification and so on (Russia) $\frac{a^{\frac{1}{2}} + ab^{-1}}{a^{-\frac{1}{3}} - a^{-\frac{1}{6}} b^{-\frac{1}{3}} + b^{-\frac{2}{3}}} - \frac{a}{\sqrt[3]{b}}$

202. Equation (Russia) $\log_{\frac{x}{4}}(x^2) - \log_{8x}(x^3) = 0$

203. Radical simplification and so on (Russia)!! $\frac{(5\sqrt{3} + \sqrt{50})(5 - \sqrt{24})}{\sqrt{75 - 5\sqrt{2}}}$

204. Equation (Russia)! $(x^2 - 3x - 4)^2 + |7x + 4|(x^2 - 1)^2 = 0$

205. Simultaneous equations (Russia) $\begin{cases} \frac{1}{x} + \frac{1}{y+z} = \frac{1}{3} \\ \frac{1}{y} + \frac{1}{x+z} = \frac{1}{5} \\ \frac{1}{z} + \frac{1}{x+y} = \frac{1}{7} \end{cases}$

206. Simultaneous equations (Russia) $\begin{cases} x^3 + y^3 = 19 \\ (xy + 8)(x + y) = 2 \end{cases}$

207. Inequality (Russia)! $\left| \sqrt{x-1} - 1 \right| \geq 1$

208. Equation with parameters (Russia)! $|x-2| + |x-5| = a$

209. Equation with parameters (Russia)!!! $\sqrt{a^2 - \sqrt{x^4 - x^2}} = x - a$

210. Radical simplification and so on (Russia)! $\sqrt[4]{(104 - 32\sqrt{10})^2} + 2\sqrt{10}$

211. Inequality (Russia)! $\left[10 + \frac{1}{1 + \frac{1}{x}} \right]^2 < 100 < \left[10 + \frac{1}{1 + \frac{1}{x+1}} \right]^2$

212. System of equation and inequality (Russia) $\begin{cases} p-x-4px+4p^2=0 \\ 2\sqrt{2px-p^2} \neq 0 \end{cases}$

213. Simultaneous equations (Russia)! $\begin{cases} \sqrt{x-4} + \sqrt{y} + \sqrt{z+4} = 6 \\ 2\sqrt{x-4} - \sqrt{y-4} - \sqrt{z+4} = -12 \\ x+y+z=14 \end{cases}$

214. Radical simplification and so on (Russia)! $\sqrt{\frac{15 - \sqrt{21}}{5\sqrt{6 - \sqrt{14}}}}$

215. Simultaneous equations (Russia)!! $\begin{cases} x^2 + 7x - y + 11 = 0 \\ y^2 + 3x - y + 15 = 0 \end{cases}$

217. Simultaneous equations (Russia)!! $\begin{cases} 2x^2 + y^2 + x - 2y = 1 \\ 5x^2 + 2.5y^2 + 3x - 4y = 4 \end{cases}$

218. Equation (Russia)! $x^2 + 2x + 1 + x^4 + \frac{1}{x} = 0$

219. Equation (Russia)! $(x^2 - 7x + 12)(x^2 + 3x + 2) = 16$

220. Radical simplification and so on (Russia)

$$\left[1 - \frac{1+ab}{1+\sqrt[3]{ab}} \right] : \left[\sqrt{ab} \cdot (1 - \sqrt[3]{ab}) - \frac{(1-ab)(\sqrt[3]{ab}-1)}{1+\sqrt{a} \cdot \sqrt{b}} \right]$$

221. Equation (Russia)! $1 + \frac{4x^2}{2x^2+8x} + \frac{27}{2x^2+7x-4} = \frac{6}{2x-1}$

222. Analysis of the function including graphs (Russia) $f(x) = 2x^3 - 9x^2 + 2; -1 < x < 4$

223. Equation (Russia)! $\sqrt[4]{97+x} + \sqrt[4]{159-x} = 4$

224. Equation (Russia) $(x^2 + 3x)(x^2 + 7x + 10) = 72$

225. Equation (Russia) $(x+1)^4 + (x+5)^4 = 32$

226. Simultaneous equations (Russia)! $\begin{cases} 4x^2 - 7xy + y^2 = 3 \\ xy + 4x - 2y = 8 \end{cases}$

227. Simultaneous equations (Russia)!! $\begin{cases} x^2 + 6y + 14 = 0 \\ y^2 + 4x - 1 = 0 \end{cases}$

228. Analysis of the function including graphs (Russia)!! $y(x) = x^6 - 3x^4 + 3x^2 - 5$

229. Equation with parameters (Russia)

$$\frac{3mx-5}{(m+2)(x-3)(x+3)} = \frac{2m+1}{(m+2)(x-3)} - \frac{5}{x+3}$$

230. Equation (Russia)! $\frac{2x+1}{6x^2-3x} - \frac{2x-1}{14x^2+7x} = \frac{8}{12x^2-3}$

231. Radical simplification and so on (Russia)!

$$(\sqrt{8}-3\sqrt{2}+\sqrt{10})(\sqrt{2}+\sqrt{1.6}+3\sqrt{0.4})$$

232. Simultaneous equations (Russia)!!

$$\left\{ \begin{array}{l} x^2-2xy-8x+16y=0 \\ 1-y^2-x=\left(\frac{2xy}{x^2-4y^4-2x^2y}\right)^2 \end{array} \right|$$

233. Equation with parameters (Russia)!

$$\sqrt{\frac{x^2+(a-x)^2}{x^2+(b-x)^2}}=\frac{a}{b}$$

234. Analysis of the function including graphs (Russia)!

$$y(x)=\frac{2x^3-3x^2-2x+1}{1-3x^2}$$

235. Inequality (Russia)!

$$\frac{x^2+x-2}{2x+3}>\frac{2}{x}$$

236. Simultaneous equations with parameters (Russia)!

$$\left\{ \begin{array}{l} \sqrt{\frac{x+a}{y}}+\sqrt{\frac{y}{x+a}}=2 \\ x+y=xy+a \end{array} \right|$$

237. Equation (Russia)!

$$\frac{1-x}{(2-x)(x-3)}+1=\frac{1}{2-x}$$

238. Equation with parameters (Russia)!

$$\frac{25-(a+10)x}{x^2}=\frac{5a}{x^2}\left(\frac{5}{x}-2\right)^{-1}$$

239. Analysis of the function including graphs (Russia) $y(x) = \frac{(1-x)^3}{(x-2)^2}$

240. System of inequalities (Russia)!
$$\left\{ \begin{array}{l} x^2 + 7x + 26 \geq \frac{224 - 112x}{x^2 - 7x + 10} \\ \frac{-x}{x + |x + 1|} \leq 4x \end{array} \right|$$

241. Equation (Russia)! $x^5 + x^4 + x^3 + x^2 + x = 62$

242. Radical simplification and so on (Russia)! $\frac{9}{2} - \sqrt{14} + \frac{9\sqrt{70}}{14\sqrt{5} - 5\sqrt{14}} - \sqrt{5}$

243. Equation (Russia) $\sqrt[4]{x^2} + 2\sqrt{-x} = 6$

244. Analysis of the function including graphs (Russia) $y(x) = x^3 (x+2)^2$

245. Equation (Russia)!! $\sqrt{x^3 - 8} = \sqrt[4]{3x - 2 - x^2}$

246. Equation with parameters (Russia)! $\frac{a^2 n}{a-x} = an + \frac{n}{x - \frac{1}{a}}$

247. Radical simplification and so on (Russia)!!
$$\frac{\sqrt{\frac{abc+4}{a}} + 4\sqrt{\frac{bc}{a}}}{\sqrt{abc} + 2}$$

248. Simultaneous equations (Russia)

$$\left\{ \begin{array}{l} (x+y) + \log_2^2 (|x|-y+5) - 12 = 0 \\ (x+y)^2 - 5(x+y) \log_2 (|x|-y+5) + 4 \log_2^2 (|x|-y+5) = 0 \end{array} \right|$$

249. Equation (Russia)!! $2^{x+1} + 20 = 6^{x-1}$

250. Radical simplification and so on (Russia)!

$$5^{\log_{0.2}(5)} + \log_{\sqrt{2}} \left[\frac{4}{\sqrt{7} + \sqrt{3}} \right] + \log_{\frac{1}{2}} \left[\frac{1}{10 + 2\sqrt{21}} \right]$$

251. Equation (Russia)!! $\sqrt[3]{24 + \sqrt{x}} - \sqrt[3]{5 + \sqrt{x}} = 1$

252. Equation (Russia)! $\sqrt{(7-2^x)^2} + \sqrt{(2^x+8)(10-2x)} = 2^x - 7$

253. Equation with parameters (Russia)!! $\sqrt[3]{x+a} + \sqrt[3]{x+a+1} + \sqrt[3]{x+a+2} = 0$

254. Equation (Russia)! $\sqrt{(7-2^x)^2} + \sqrt{(2^x+8)(10-2x)} = 2^x - 7$

255. Equation (Russia) $\log_{\sqrt{5}}(2^{2x-2} + 2^{x+1} - 12 + 5^x + 2^x) = 2x$

256. Equation (Russia) $\log_{2\sqrt{2+\sqrt{3}}}(x^2 - 2x + 2) = \log_{2+\sqrt{3}}(x^2 - 2x + 2)$

257. Equation with parameters (Russia) $\log_{x-a}(x^2 - x - 1) = 2$

258. Equation (Russia)! $2 \cdot 15^x - 3^{x+2} - 4 \cdot 5^{x+1} + 90 = 0$

259. Equation (Russia)! $x^2 \cdot 4^{\sqrt{2-x}} + 4^{2-x} = 4^{\sqrt{2-x} + 2} + x^2 \cdot 2^{-2x}$

260. Simultaneous equations (Russia) $\left\{ \begin{array}{l} 2^x \cdot 8^{-y} = 2\sqrt{2} \\ \log_9 \left(\frac{1}{x} \right) + 0.5 = \frac{1}{2} \log_3(9x) \end{array} \right. |$

261. Simultaneous equations (Russia)! $\left\{ \begin{array}{l} 4^{x+y} = 2^{y-x} \\ 4^{\log_{\sqrt{2}}(x)} = y^4 - 5 \end{array} \right. |$

262. Equation (Russia)

$$49^{2 \log_4(x-2)} \cdot 7^{\log_{\sqrt{2}}(\sqrt{12-x})} = 49^{\log_2\left(\sqrt{\left(1-\frac{2}{x}\right)^2}\right)} \cdot 7^{\log_2(x)}$$

263. Simultaneous equations (Russia) $\left\{ \begin{array}{l} y^{1-0.2 \log_x(y)} = x^{0.8} \\ 2 + \log_x\left(1 - \frac{3y}{x^2}\right) = \log_x(4) \end{array} \right.$

264. Equation (Russia) $64 \frac{1}{x} - 2 \frac{3x+3}{x} + 12 = 0$

265. Equation (Russia) $(\sqrt{2})^{2x-5} \cdot (\sqrt{3})^{x-7} = \sqrt{\frac{8}{27}}$

266. Radical simplification and so on (Russia)

$$\log_6\left(\log_7\left(\sqrt[4]{\sqrt[3]{49}}\right) + 9 \log_8\left(\sqrt[3]{16}\right)\right)$$

267. Equation (Russia)!! $5^{1+2x} + 6^{1+x} = 30 + 150^x$

268. Equation with parameters (Russia)!! $x^2 + y^2 + z^2 + t^2 = x(y+z+t)$

269. Equation (Russia)! $\lg(3^x + x + 12) = x \lg(30) - x$

270. Equation (Russia) $\log_6(3 \cdot 4^{-t} + 2 \cdot 9^{-t}) + t = \log_6(5)$

270. Equation (Russia)! $\lg(3^x + x + 12) = x \lg(30) - x$

271. Equation (Russia)! $x \cdot 2^x - 4x - 4 + 2^x = 0$

272. Equation (Russia)! $16 \frac{x}{6} + \frac{1}{2} - 4 \cdot 5^x = 0$

273. Radical simplification and so on (Russia) $\sqrt{11}^{\log_{\sqrt{3}}(9) - \log_{121}(81)}$

274. Radical simplification and so on (Russia) $\log_{0.01}(125) \cdot \log_{0.2}(1000)$

275. Simultaneous equations (Russia)

$$\begin{cases} 10 \log_x^2(4) - 13 \log_x(4) + \log_x(4) + 2 = 0 \\ xy = 7 \end{cases}$$

276. Equation with parameters (Russia)!

$$\sqrt{(x-2)^2 + \frac{4a^2}{(x-3)^2}} + x - 2 = x - 2 - \frac{2a}{x-3}$$

277. Simultaneous equations with parameters (Russia) $\begin{cases} x + y = a \\ x^2 - y^2 = b + x \end{cases}$

278. Equation (Russia) $5 \cdot 3^{\log_x(4x-3)} + 3 \cdot 5^{\log_x(4x-3)} = 8 \cdot 15^{\log_{x^2}(4x-3)}$

279. Simultaneous equations (Russia) $\begin{cases} 10 \lg(x^2 + y^2) + 1.5 = 200\sqrt{10} \\ \frac{\sqrt{x^2 + 10y}}{3} = \frac{6}{2\sqrt{x^2 + 10y - 9}} \end{cases}$

280. Equation (Russia)! $x^x + x^{x-1} = x + 1$

281. Equation (Russia)! $7^x \cdot (\sqrt{2})^{2x^2-6} - \left(\frac{7}{4}\right)^x = 0$

282. Simultaneous equations (Russia) $\begin{cases} 3^x + \log_2(y) = 1 \\ \log_2(\sqrt{y}) = -3^{1-x} \end{cases}$

283. Radical simplification and so on (Russia) $0.25 \cdot \left(1 + 4^{\log_2(5)}\right)^{\log_{26}(4)}$

284. Equation (Russia) $\left(1 + \frac{1}{2x}\right) \cdot \lg(3) + \lg(2) = \lg\left(27 - 3 \frac{1}{x}\right)$

285. Equation (Senegal) $\sqrt{2x+3} + 2 = \sqrt{4x+1}$

286. Analysis of the function including graphs (Serbia) $\frac{x^2 + 3x}{3 - 2x}$

287. Analysis of the function including graphs (Serbia) $\frac{2x^5}{x^4 - 1}$

288. Complex numbers (Serbia) $x^2 + x - 1 - 3i = 0$

289. Equation (South Korea) $\sqrt{x-2} - \sqrt{3-x} \geq 1$

290. Simultaneous equations with parameters (South Korea)! $\left\{ \begin{array}{l} \frac{d+1}{x} = \frac{d-1}{z} \\ \frac{d+2.1}{x} = \frac{d-2.1}{y} \\ \frac{2d}{z} = \frac{2d-4.2}{y} \end{array} \right.$

291. Simultaneous equations (Spain) $\left\{ \begin{array}{l} a+10+b=42 \\ c+d+e=42 \\ g+f+h=42 \\ a+c+f=42 \\ 10+d+g=42 \\ b+e+h=42 \\ a+d+h=42 \\ b+d+f=42 \end{array} \right.$

$$292. \text{ Simultaneous equations (Spain) } \left\{ \begin{array}{l} x = \frac{3x}{4} + \frac{y}{4} \\ y = \frac{x}{4} + \frac{y}{2} + \frac{z}{4} \\ z = \frac{y}{4} + \frac{3z}{4} \\ x + y + z = 1 \end{array} \right. |$$

$$293. \text{ Equation (Spain) } \lg(\sqrt{2(x+3)}) - \lg(\sqrt{3x-6}) = 1 - \lg(5)$$

$$294. \text{ Equation (Spain) } x^4 - x^3 + 10 = 0$$

$$295. \text{ Simultaneous equations (Spain) } \left\{ \begin{array}{l} \log_2(x) + 3 \log_2(y) = 5 \\ \log_2\left(\frac{x^2}{y}\right) = 3 \end{array} \right. |$$

$$296. \text{ Radical simplification (Switzerland) } \sqrt{15} \cdot \sqrt{77} \cdot \sqrt{45} \cdot \sqrt{21}$$

$$297. \text{ Equation (Switzerland) } \frac{3x+2}{x} - \frac{1}{x-3} = \frac{x^2-6}{x^2-3x} + 2$$

$$298. \text{ Inequality (Taiwan) } \log_2 \left[1 + \log_{\frac{1}{3}}(x) \right] < 1$$

$$299. \text{ Analysis of the function including graphs (Turkey) } y = \frac{(x-1)(x-2)}{x-3}$$

$$300. \text{ Analysis of the function including graphs (Turkey) } f(x) = 4x^5 + 7x^4 + 3x^3$$

$$301. \text{ Equation (Turkey) } |3x - |2x - |x|| = 6$$

302. Equation (Turkey) $x^4 - x^3 - 24x^2 + 2x + 4 = 0$

303. Radical simplification (Turkey) $\frac{4\sqrt{3}}{2 + \sqrt{3} - \sqrt{7}} - \sqrt{3} - \sqrt{7}$

304. Complex numbers (Turkey) $\frac{4}{1 - \frac{2}{1 + \frac{2}{1 - \frac{1}{i}}}}$

305. Equation (Turkey) $x^3 - 9x^2 + 27x = 35$

306. Equation (Turkey) $x^{2007} + \left(\frac{1}{2} - x\right)^{2007} = 0$

307. Equation (Turkey) $(x-3)(x-2)(x+1)(x+2) = 21$

308. Equation (Turkey) $\frac{\sqrt[4]{16^{2x-3}}}{\sqrt[3]{8^{x-5}}} = \frac{1}{16}$

309. Inequality (UK) $\sqrt{-x^2 - 2x + 8} + \sqrt{x^2 - 2x} \geq 0$

310. Equation (UK) $\frac{\left|\frac{x}{x+1}\right|}{\frac{1}{x} - \frac{1}{x+1}} = \frac{\frac{x+1}{x}}{\left|\frac{1}{x-1} - \frac{1}{x}\right|}$

311. Simultaneous equations (UK) $\begin{cases} k(k-m) = 12 \\ k(k+m) = 60 \end{cases}$

312. Equation (UK) $\log_5((x-8)^2) = 2 + 2 \log_5(x-2)$

313. Equation with parameters (Ukraine)! $||x|-1|=2x+a$

314. Simultaneous equations (Ukraine) $\begin{cases} x+y=2 \\ xy+xz+yz=5 \\ x^2+y^2+z^2=6 \end{cases}$

315. Radical simplification and so on (Ukraine) $\frac{4\sqrt{3}}{\sqrt{2}+\sqrt{3}+\sqrt{5}} + \sqrt{10} - \sqrt{6}$

316. Equation with parameters (Ukraine) $\frac{2(x+a)(x+b)-(x-c)(x+1)}{(x+c)(x+1)} = 1$

317. Inequality (Ukraine)! $\sqrt{x^2-9x+20} \leq \sqrt{x-1} \leq \sqrt{x^2-13}$

318. Radical simplification (Ukraine) $\frac{3\sqrt{24}}{\sqrt{90-4\sqrt{6}}} + 5\sqrt{1.2} (\sqrt{30} + 3\sqrt{2})$

319. Simultaneous equations (Ukraine)!! $\begin{cases} a+b=4 \\ ab+c+d=-19 \\ ad+cb=-46 \\ cd=120 \end{cases}$

320. Equation with parameters (Ukraine) $(ax+3)^2 = 4x+bx+9$

321. Equation (Ukraine) $\sqrt{x+1} - \sqrt[3]{2x-6} = 2$

322. Equation (Uruguay)! $3x^4 - 2x^3 + 16 = 0$

323. Inequality (Uruguay) $(x+6)(x-1) \leq (x+1)(x+2) \leq (x+5)(x+2)$

324. Analysis of the function including graphs (Uruguay)

$$f(x) = -2(x+2)^2(x-5)(x-1)$$

325. Analysis of the function including graphs (Uruguay) $y = (x+2)(x+4)(x-2)$

326. Analysis of the function including graphs (USA) $f(x) = \frac{5x^2 - 3x + 8}{x-2}$

327. Radical simplification (USA) $(2 - \sqrt{x}) \left[\frac{1}{\sqrt{x}} + \frac{1}{2 - \sqrt{x}} \right]$

328. Equation (USA) $x(x+3) + (x^2 - x - 2)(x^2 + 7x + 10) + 32 = 0$

329. Simultaneous equations with parameters (USA)
$$\begin{cases} \frac{a}{x} - \frac{1}{y} = 3 \\ \frac{1}{x} + \frac{1}{y} = -3 \end{cases}$$

330. Simultaneous equations with parameters (USA)
$$\begin{cases} ax + |y| = 1 + a \\ x + ay = 1 - a \end{cases}$$

331. Radical simplification (USA) $\frac{x-y}{\sqrt{x} + \sqrt{y}} + \frac{\sqrt{xy} + y}{\sqrt{y}}$

332. Simultaneous equations (USA)
$$\begin{cases} \log_3(2) + \log_3(x) = 1 + \log_3(y) \\ \log_{25}(x+y) = 0.5 \end{cases}$$

333. Equation (USA) $x^2 + \frac{1}{x^2} + 2 \left(x - \frac{1}{x} \right) = 5$

334. Inequality (USA) $x - \sqrt{x-1} > 7$

335. Complete factoring (USA) $8ax - 6bx + 2x - 4a + 3b - 1$

336. Equation (USA) $\sqrt{1 + \frac{x^2}{4-x^2}} = \frac{2}{\sqrt{4-x^2}}$

337. Simultaneous equations (USA) $\begin{cases} x^2 + y^2 = 25 \\ (x-8)^2 + y^2 = 41 \end{cases}$

338. Radical simplification and so on (USA) $a\sqrt{8} - 3\sqrt{2a^2}$

339. Equation with parameters (USA) $\frac{b+c}{x+a} = \frac{b-c}{x-a}$

340. Equation (USA) $\sqrt{-12z+183} - \sqrt{4z+135} = -4$

341. Equation (USA) $16^x - 4^x = 2 \cdot 8^x - 2^{x+1}$

342. Analysis of the function including graphs (Venezuela) $f(m) = \frac{2m^3 - 18m}{2m^2 - 6}$

343. Analysis of the function including graphs (Venezuela) $f(x) = \frac{1}{x^3 - 3x^2}$

344. Analysis of the function including graphs (Vietnam) $y = \frac{x^2 - 3x - 1}{x - 2}$

