

Hatványozás

$$1. \frac{24^{-4}}{8^{-4}} =$$

$$2. 2^{-3} \cdot 5^{-3} =$$

$$3. (3^{-2})^{-3} =$$

$$4. \frac{\left(\frac{2}{5}\right)^{-6}}{\left(\frac{2}{5}\right)^{-3}} =$$

$$5. \left(\frac{3}{5}\right)^{10} \cdot \left(\frac{3}{5}\right)^{-8} =$$

$$6. 5^{-6} \cdot 5^8 =$$

$$7. \left(-\frac{3}{4}\right)^2 \cdot \frac{128}{27} - \frac{(-2)^3 \cdot (-1)^5}{\left(\frac{2}{5}\right)^{-1} - (-3) \cdot 6^{-1}} + (-5)^2 =$$

$$8. \left(-\frac{2}{3}\right)^3 \cdot \frac{(-9)^2}{2^4} - \frac{(-4)^3 \cdot \left(\frac{1}{2}\right)^5}{2^{-1} - (-4) \cdot 8^{-1}} + (-2)^{-1} =$$

$$9. \frac{(x^{-2}y^3)^{-4} \cdot (y^4)^3 \cdot (x^5y^3)^{-2}}{(y^5x^3)^{-1} \cdot y^{-2}} =$$

$$10. \frac{(a^{-4}b^3)^{-5} \cdot (b^{-1})^3 \cdot (a^2b^{-3})^{-4} \cdot a^{-2}}{(b^{-2}a^4)^2 \cdot b^{-4}} =$$

Azonosságok

Két tag összegének, különbségének négyzete:

$$11. \left(5x - \frac{3}{5}\right)^2 =$$

$$15. \left(\frac{5}{2}a - 4\right)^2 =$$

$$20. (a - b)^2 =$$

$$27. (7x^3 - b^2)^2 =$$

$$12. \left(4x - \frac{5}{2}\right)^2 =$$

$$16. \left(6x - \frac{2}{3}\right)^2 =$$

$$21. (4x - 8)^2 =$$

$$28. (3x - 5)^2 =$$

$$13. \left(6b - \frac{5}{3}\right)^2 =$$

$$17. (3x + 7y)^2 =$$

$$22. (6y + 5)^2 =$$

$$23. (2x - 6y)^2 =$$

$$14. \left(8x - \frac{3}{2}\right)^2 =$$

$$19. (2z + 6)^2 =$$

$$24. (4x - 3y)^2 =$$

$$25. (6z + 3)^2 =$$

$$26. (3a - b^2)^2 =$$

Három tag összegének, különbségének négyzete:

$$29. (2x - y + 3z)^2 = \quad 34. (3a - 2b + c)^2 = \quad 39. (4a - 2 + 3c)^2 = \quad 44. (x - 5 + 3y)^2 =$$

$$30. (a - 2x + 4)^2 = \quad 35. (3a - b + c)^2 = \quad 40. (3x - y + 5)^2 = \quad 45. (x + 2y - 5)^2 =$$

$$31. (3x - y + 2z)^2 = \quad 36. (2x + y - z)^2 = \quad 41. (a + b + c)^2 =$$

$$32. (x + 2y - 3z)^2 = \quad 37. (a + b + c)^2 = \quad 42. (5 + a - b)^2 =$$

$$33. (x - 3y + 4z)^2 = \quad 38. (x + 2b - 3)^2 = \quad 43. (4 + a - b)^2 =$$

Két tag összegének, különbségének köbe:

$$46. (a + b)^3 = \quad 52. (2x - 4)^3 = \quad 58. (3x - 2)^3 = \quad 64. (2a + 4c)^3 =$$

$$47. (a - b)^3 = \quad 53. (2x - y)^3 = \quad 59. (3y - 6)^3 = \quad 65. (4y + 1)^3 =$$

$$48. (3a - 4)^3 = \quad 54. (a - 3b)^3 = \quad 60. (3x - 2y)^3 = \quad 66. (5a - 1)^3 =$$

$$49. (2y + 3)^3 = \quad 55. (4a - 5b)^3 = \quad 61. (3a - 2)^3 = \quad 67. (2c - 5d)^3 =$$

$$50. (2x - 3)^3 = \quad 56. (2a - 3b)^3 = \quad 62. (3 - 4z)^3 =$$

$$51. (2x - 5y)^3 = \quad 57. (2a + 3)^3 = \quad 63. (4a + c)^3 =$$

Két tag négyzetének különbsége:

$$68. 64a^2 - 100 = \quad 70. a^2 - b^2 = \quad 72. 64 - 16c^2 =$$

$$69. 100b^4 - 36 = \quad 71. 81c^2 - 49 = \quad 73. 9c^2 - 25 =$$

Két tag köbének összege, különbsége:

$$74. 8y^3 - 27 = \quad 75. 8x^3 - 1 = \quad 76. x^3 - 27 = \quad 77. 64a^3 - 8 =$$

78. $8y^3 - 27 =$

80. $27a^3 + 64 =$

82. $z^3 + 64 =$

84. $y^3 - 64 =$

79. $a^3 + b^3 =$

81. $b^3 - 27 =$

83. $64a^3 + 8 =$

85. $b^3 + 27 =$

Teljes négyzetté alakítás

86. $9z^2 + 6z + 1 =$

87. $4b^2 - 4b + 4 =$

Kiegészítés teljes négyzetté

88. $b^2 - 18b + 100 =$

89. $a^2 - 12a + \dots = \dots$

90. $x^2 - 16x + \dots = \dots$

91. $x^2 - 14x + \dots = \dots$

92. $b^2 - 10b + \dots = \dots$

93. $y^2 - 8y + \dots = \dots$

94. $y^2 - 12y + \dots = \dots$

95. $z^2 - 14z + \dots = \dots$

96. $b^2 - 16b + \dots = \dots$

97. $x^2 + 20x + \dots = \dots$

98. $b^2 - 14b + \dots = \dots$

99. $a^2 + 18a + \dots = \dots$

100. $c^2 - 18c + \dots = \dots$

101. $a^2 + 12a + \dots = \dots$

102. $b^2 - 20b + \dots = \dots$

103. $y^2 - 10y + \dots = \dots$

104. $a^2 - 10a + \dots = \dots$

105. $9x^2 - 30xy + \dots = \dots$

106. $9a^2 + 24a + \dots = \dots$

107. $25a^2 - 40a + \dots = \dots$

108. $36a^2 - 48ab + \dots = \dots$

109. $36x^2 - 60xy + \dots = \dots$

110. $16b^2 - 48bc + \dots = \dots$

111. $4x^2 - 16x + \dots = \dots$

112. $25b^2 - 70b + \dots = \dots$

113. $16c^2 - 12c + \dots = \dots$

114. $9z^2 + 30z + \dots = \dots$

115. $b^2 - 18b + 100 =$

116. $x^2 + 2x - 15 =$

117. $x^2 + 6x + 5 =$

118. $x^2 - 8x + 7 =$

Szorzáttá alakítás

119. $4x^5 - 8x^4 + 4x^3 =$

120. $5x^3 - 20x^2 + 20x =$

121. $y^5 + 4y^4 + 4y^3 =$

$$\begin{array}{lll}
122. z^3 - 6z^2 + 9z = & 133. 2x^5 + 12x^4 + 18x^3 = & 145. b^2x^2 - 8b^2x + 16b^2 = \\
123. a^3b^2 + 8a^3b + 16a^3 = & 134. 3x^3 - 6x^2 + 3x = & 146. a^3b - 6a^2b^2 + 9ab^3 = \\
124. x^3 + 2x^2 - x - 2 = & 135. 2x^3 - 32x = & 147. a^3 - 2a^2 - 9a - 18 = \\
125. 4ab - 6a^2 + 6b^2 - 9ab = & 136. 3xy^2 + 6xy + 3x = & 148. x^3y + 4x^2y^2 + 4xy^3 = \\
126. 6xy + 8y^2 + 3x^2 + 4xy = & 137. 4x^2 - 4xz - 3x + 3z = & 149. x^3 + 3x^2 - 4x - 12 = \\
127. 6ab + 8a^2 - 3b^2 - 4ab = & 138. ab^3 - 8ab^2 + 16ab = & 150. b^2 - 18b + 100 = \\
128. 4x^5 - 8x^4 + 4x^3 = & 139. a^3 + 2a^2 - 4a - 8 = & 151. x^2 + 2x - 15 = \\
129. 3y^3 - 6y^2z^2 + yz - 2z^3 = & 140. x^2y^2 + 12yx^2 + 36x^2 = & 152. x^2 + 6x + 5 = \\
130. 3x^5 + 3x^3 - 6x^4 = & 141. a^3 - a + 3a^2 - 3 = & 153. x^2 - 8x + 7 = \\
131. a^3 + a^2 - a - 1 = & 142. x^3 - 12x^2 + 36x = & \\
132. a^3 - 4a^2 + 3a - 12 = & 143. x^2y^2 + 12yx^2 + 36x^2 = & \\
& 144. 2a(x-1) + a(1-x) = &
\end{array}$$

Algebrai törtek szorzása, osztása

$$\begin{array}{ll}
154. \frac{2ab - a^2}{4b^2 - a^2} : \frac{a}{6b + 3a} = & 159. \frac{4x + 8}{2x^2 - 4x} : \frac{x^2 + 4x + 4}{x^2 - 4} = \\
155. \frac{x^2 - 25}{x^2 + 10x + 25} : \frac{5x - 25}{10x^2 + 50x} = & 160. \frac{a^2 + 12a + 36}{a^2 - 36} : \frac{2a^2 + 12a}{4a^3 - 24a^2} = \\
156. \frac{(4x^3z)^2 (y^2)^3 (4x^4z)^2 y^3 z^4}{(3x^2z)^3 (xy^2)^5 (3x^2yz^2)^3} = & 161. \frac{6x^4 + 12x^3}{3x^2 - 6x} : \frac{x^2 - 4}{x^2 - 4x + 4} = \\
157. \frac{a^2 + 2ab + b^2}{a^2b - ab^2} : \frac{a^2 + ab}{ab - b^2} = & 162. \frac{a^2b^3 - 9b^5}{ab^4} : \frac{a^2 - 3ab}{3a^2b} = \\
158. \frac{4y^2 + 16y}{y^2 + 8y + 16} : \frac{4y - 16}{y^2 - 16} = & 163. \frac{a^2b - 4b^3}{3ab^2} : \frac{a^2 - 2ab}{a^2b} =
\end{array}$$

$$164. \frac{x^2 - y^2}{x^2 + 2xy + y^2} : \frac{2x - 2y}{4x^2 + 4xy} =$$

$$165. \frac{3a^2 - 3b^2}{a^2 + ac} : \frac{6a - 6b}{a + c} =$$

$$166. \frac{a^2 - b^2}{a^2} \cdot \frac{a^4}{(a+b)^2} =$$

$$167. \frac{a+b}{a-b} : \frac{a^2 + ab}{2a^2 - 2b^2} =$$

$$168. \frac{7}{4x^3 - 36x} \cdot \frac{x^2 - 9}{14} =$$

$$169. \frac{a^2 - b^2}{(a+b)^2} \cdot \frac{3a+3b}{5a-5b} =$$

$$170. \frac{(2x^3y^4)^2(z^2)^3}{(5x^2y)^4(xy^2z)^2} : \frac{(2z)^2yz^4}{(5^2x^5z^3)^2} =$$

$$171. \frac{2ab - a^2}{4b^2 - a^2} \cdot \frac{6b + 3a}{a} =$$

$$172. \frac{a^2 + 6a + 9}{2a + 6} : \frac{a^2 - 9}{4a^2 - 12a} =$$

Algebrai törtek összeadása, kivonása

$$173. \frac{2}{x^2 + 4x} + \frac{1}{x+4} - \frac{x+6}{x^2 + 8x + 16} =$$

$$174. \frac{a-b}{2a+2b} + \frac{a+b}{2a-2b} - \frac{a^2+b^2}{a^2-2ab+b^2} =$$

$$175. \frac{5a}{6b^2c} - \frac{b}{12ac^2} + \frac{5c}{18a^2b^2} =$$

$$176. \frac{1}{3x-12} + \frac{x}{x^2-16} + \frac{x}{x^2-8x+16} =$$

$$177. \frac{3a^2}{4b^3c} - \frac{5b}{8c^2a} + \frac{7c^3}{12b^2a} =$$

$$178. \frac{5c^2}{4a^3b} - \frac{5a}{8b^2c} + \frac{7b^3}{12a^2c} =$$

$$179. \frac{2c^2}{3ab^3} + \frac{5a}{6bc^2} - \frac{4b^2}{9ac} =$$

$$180. \frac{5}{x^2+5x} - \frac{1}{x+5} - \frac{x}{x^2+10x+25} =$$

$$181. \frac{3}{2x^2-2x} - \frac{x}{x^2-2x+1} + \frac{1}{x-1} =$$

$$182. \frac{c}{8a^2b} - \frac{3b}{16ac^2} + \frac{5a}{24cb^2} =$$

$$183. \frac{2}{x^2+2x} + \frac{x}{(x+2)^2} - \frac{3}{3x+6} =$$

$$184. \frac{x}{x^2+12x+36} - \frac{6}{x^2+6x} + \frac{1}{x+6} =$$

Összetett feladatok

$$185. \left(\frac{3a}{1-3a} + \frac{2a}{3a+1} \right) : \frac{6a^2+10a}{1-6a+9a^2} =$$

$$186. \left(1 - \frac{a^2}{b^2} \right) \cdot \left(a - b - \frac{a^2}{a+b} \right) =$$

$$187. \frac{(3a-1)(2a+1)^2 - 3a(2a+3)^2 + 1}{-28a}$$

$$188. \left(\frac{b^2}{a^3 - ab^2} + \frac{1}{a+b} \right) : \left(\frac{a-b}{a^2+ab} - \frac{a}{b^2+ab} \right) =$$

$$189. \left(\frac{5}{2a+3} + \frac{2}{3-2a} + \frac{2a+9}{4a^2-9} \right) : \frac{8}{4a^2+12a+9}$$

$$195. \left(\frac{2a+2}{a^2+2a} + \frac{a}{2a+4} \right) : \frac{a+2}{2a} =$$

$$196. \left(\frac{5}{2a+3} + \frac{2}{3-2a} + \frac{2a+9}{4a^2-9} \right) : \frac{8}{4a^2+12a+9} =$$

$$190. \left(\frac{2a+2}{a^2+2a} + \frac{a}{2a+4} \right) \cdot \frac{2a+2}{a+2} - \frac{1}{a} =$$

$$191. \left(\frac{a^2-3ab}{a+b} + b \right) : \left(\frac{a}{a+b} - \frac{b}{b-a} - \frac{2ab}{a^2-b^2} \right) =$$

$$197. \left(\frac{b}{a^2-ab} + \frac{a}{b^2-ab} \right) \cdot \frac{a^2b+ab^2}{a^2-b^2} =$$

$$198. \left(\frac{x+a}{a} - \frac{x-a}{x} \right) : \left(\frac{x}{x-a} - \frac{a}{x+a} \right) =$$

$$192. \left(\frac{a}{a+1} + 1 \right) : \left(1 - \frac{3a^2}{1-a^2} \right) =$$

$$199. \frac{3}{a^2-6a+9} - \frac{6}{a^2-3a} + \frac{3}{a^2-9} =$$

$$193. \left(\frac{a}{x+a} - \frac{ax}{a^2+2ax+x^2} \right) \cdot \frac{x^2+2ax+a^2}{a^2} =$$

$$200. \left(\frac{2x-1}{3x-6} - \frac{x+1}{2x-4} \right) : \frac{x-5}{6} =$$

$$194. \left(\frac{a+1}{2a-2} + \frac{6}{2a^2-2} - \frac{a+3}{2a+2} \right) : \frac{3}{4a^2-4} =$$

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