Usuń niewymierność z mianownika

(1) $\dfrac{1}{\sqrt{2}}$ (2) $\dfrac{1}{\sqrt{3}}$ (3) $\dfrac{1}{\sqrt{7}}$ (4) $\dfrac{1}{\sqrt{4}}$

(5) $\dfrac{\sqrt{2}}{\sqrt{3}}$ (6) $\dfrac{\sqrt{2}+1}{\sqrt{5}}$ (7) $\dfrac{\sqrt{2}+\sqrt{3}}{\sqrt{7}}$ (8) $\dfrac{\sqrt{7}-2}{\sqrt{2}}$

(9) $\dfrac{2-\sqrt{11}}{\sqrt{3}}$ (10) $\dfrac{3\sqrt{3}}{\sqrt{2}}$ (11) $\dfrac{3\sqrt{7}-2\sqrt{2}}{3\sqrt{2}}$ (12) $\dfrac{-\sqrt{7}-1}{-\sqrt{2}}$

(13) $\dfrac{1}{\sqrt{2}+1}$ (14) $\dfrac{1}{\sqrt{2}-1}$ (15) $\dfrac{\sqrt{2}}{\sqrt{5}-1}$ (16) $\dfrac{3\sqrt{2}}{\sqrt{7}+3}$

(17) $\dfrac{2\sqrt{3}-4}{1-\sqrt{2}}$ (18) $\dfrac{\frac{1}{2}+\sqrt{2}}{\sqrt{2}-2}$ (19) $\dfrac{\sqrt{2}-\sqrt{3}}{\sqrt{5}-\sqrt{7}}$ (20) $\dfrac{\sqrt{3}-3\sqrt{2}}{\sqrt{7}+2\sqrt{3}}$

Oblicz

(21) $\left(\frac{3+\sqrt{2}}{2}\right)^2$

(22) $\left(\frac{1+\sqrt{3}}{\sqrt{2}}\right)^2$

(23) $3 \cdot \sqrt[3]{27} + 3$

(24) $\frac{1}{8}\left(4 - \frac{\sqrt{2}}{3}\right)^2$

(25) $-\left[\sqrt{2} - \sqrt{3} \cdot (\sqrt{6} - 1)\right]$

(26) $(\sqrt{2} + \sqrt{3})(\sqrt{2} - \sqrt{3})$

(27) $\left(3 \cdot 3^{\frac{1}{2}} + 3^{\frac{1}{3}}\right) \cdot \sqrt{3}$

(28) $\sqrt[7]{3} \cdot 3^{\frac{1}{7}} \cdot \left(\sqrt{3} \cdot \sqrt{2} - \sqrt{6}\right)$

(29) $3^7 \cdot 3^{-7} \cdot 3^3$

(30) $2^5 \cdot 2^{-4} - 4^7 : 4^6$

(31) $2^7 \cdot 4^{-3} + 3^{14} : \left(\frac{1}{3}\right)^{-15}$

(32) $1 - \frac{1}{3^2} + 3 \cdot \sqrt{3} \cdot 3^{\frac{1}{2}}$

(33) $\frac{-2 + 16^{-\frac{1}{2}}}{\sqrt{2}}$

(34) $\frac{3^{13}}{9^5} \cdot 9$

(35) $\frac{2 \cdot 2^7 : \left(\frac{1}{4}\right)^{-2}}{2^7}$

(36) $\frac{\sqrt[3]{9} \cdot 3^{-2} \cdot \sqrt[4]{3}}{3}$

Narysuj wykres funkcji

(37) $y = x$

(38) $y = 2x$

(39) $y = 3x$

(40) $y = \frac{1}{2}x$

(41) $y = \frac{1}{3}x$

(42) $y = x + 1$

(43) $y = x + 2$

(44) $y = x - 2$

(45) $y = 2x - 1$

(46) $y = 3x - 2$

(47) $f(x) = 2 - x$

(48) $f(x) = \frac{1}{2}x - 2$

(49) $y = 2x - 4$

(50) $y = -x$

(51) $y = -2x$

(52) $y = -3x - 2$

(53) $y = -\frac{1}{2}x - 4$

(54) $y = 2$

(55) $g(t) = 3t + 1$

(56) $x \mapsto x - 2$

(57) $t \mapsto -2 - 2t$

(58) $f(x) = 0$

(59) $2y = 4x - 2$

(60) $y = x \cdot \sqrt{2} - 1$

Rozwiąż równanie

(61) $-3x = 4 - 2 \cdot (3x + 2)$

(62) $x^2 - 2x = 4 + (x + 1)^2$

(63) $x - (1 - 2x) = 3$

(64) $x - (2x + 1)^2 = -x - 4x^2 + 3$

(65) $4x + 1 = 3x - \sqrt{2}$

(66) $1 - 3x = 3\sqrt{2} \cdot x - 3$

(67) $2 - \frac{1}{2}(x + 7) = \frac{3 - x}{2}$

(68) $\frac{2 - x}{3} + \frac{x - 4}{2} = 1$

(69) $(x + 4)(x + 3) = x^2 - 7$

(70) $\frac{4x - 2}{2} - \frac{3x - 3}{3} = 4 - x$

(71) $\frac{2x + 7}{3} = \frac{4x - 1}{5}$

(72) $\frac{7 - 3t}{2} - t + 4 = 3t - 1$

(73) $x(x - 3) - x^2 = 0$

(74) $(x + 4)(3 - x) = -x^2 - (2x + 1)$

(75) $\frac{\sqrt{3}}{3} \cdot x(x - 3) = \frac{x(6x - 1)}{6\sqrt{3}}$

(76) $\frac{x}{\sqrt[3]{2}} \cdot 2^{\frac{4}{3}} = \frac{4^3}{2^{2\frac{1}{2}}} - 2x$

Zaznacz na osi liczbowej

(77) $x \in (1, 3)$ (78) $x \in (1, 3\rangle$ (79) $x \in \langle 1, 3\rangle$

(80) $x \in (-\infty, 1\rangle$ (81) $x \in (-\infty, \frac{3}{2})$ (82) $x \in (1, 3\rangle \cup \langle 5, 10)$

(83) $x \in (-1, 1) \cup (2, \infty)$ (84) $x \in (-\infty, -1\rangle \cup \langle 1, \infty)$

(85) $x \in (-\infty, 1) \cup (1, \infty)$ (86) $x \in \langle 1, 5\rangle \cap \langle 2, 10\rangle$

(87) $x \in (-7, 1) \cap (-1, 3)$ (88) $x \in (-\infty, 5\rangle \cup (2, 7)$

(89) $x \in (-3, 1\rangle \cup (1, \infty)$ (90) $x \in (-\infty, 3) \cap \langle 1, \infty)$

(91) $x \in (-7, 1) \cap (5, \infty)$ (92) $x \in (0, 4) \cup \{6\}$

(93) $x \in (-1, 1) \cap \{0\}$ (94) $x \in (-7, 7) \setminus \langle 0, 10\rangle$

Rozwiąż nierówność

(95) $2x - 6 \leq x$

(96) $x - \frac{1}{2} \leq \frac{3}{4} - x$

(97) $-3x - (3 - x) \geq -x + 3$

(98) $3x - \dfrac{x-2}{2} \leq x$

(99) $\dfrac{x+3}{3} + \dfrac{x+2}{2} < 0$

(100) $\dfrac{2x-3}{4} > \dfrac{x+2}{2}$

(101) $\dfrac{2x-3}{4} \geq -\dfrac{-x-2}{2}$

(102) $-\dfrac{3-x}{2} \geq \dfrac{2x-1}{4}$

(103) $x + \dfrac{-2x+3}{4} \leq -2 \cdot \dfrac{2+x}{2}$

(104) $|x - 1| < 3$

(105) $|x + 7| \leq 3$

(106) $3 - |x + 1| < 0$

(107) $|2x - 1| \geq 3$

(108) $|x| < 0$

(109) $3 \cdot |1 - x| > 1$

(110) $3 < |x - 3|$

Rozwiąż równanie

(111) $x^2 - 3x + 2 = 0$

(112) $x^2 - 2x + 1 = 0$

(113) $2x^2 - 5x + 2 = 0$

(114) $x^2 - 8x + 15 = 0$

(115) $x^2 + 2x + 1 = 0$

(116) $x^2 + 3x + 2 = 0$

(117) $x^2 - 6x + 9 = 0$

(118) $2x^2 - 2x = 0$

(119) $9x + 3x^2 - 12 = 0$

(120) $2x(x - 4) = 0$

(121) $(x - 3)(x + 4) = 0$

(122) $2x^2 + 18 = 12x$

(123) $-5x + 2x^2 = -3$

(124) $\dfrac{-x^2 + x}{2} + x = 3$

(125) $\dfrac{x - 3}{x} - x + 4 = 0$

(126) $\dfrac{x - 1}{x + 1} = \dfrac{x - 2}{x + 2}$

Rozwiąż nierówność

(127) $x^2 - 1 > 0$

(128) $2 + x^2 - 3x > 0$

(129) $x^2 + 6 \leq 5x$

(130) $x^2 + x - 2 < 0$

(131) $x^2 + 2x + 3 \geq 0$

(132) $x(x - 3) < 0$

(133) $-2x^2 + 2x - 7 > 0$

(134) $2x^2 - 4x - 6 < 0$

(135) $x^2 - 2x + 2 > 0$

(136) $x^2 + 4x + 4 \leq 0$

(137) $3x^2 - 8x + 5 < 0$

(138) $2(x - 3)(x + 2) \leq 0$

(139) $3x^2 - x + 2 \geq 0$

(140) $-x^2 - x - 2 \leq 0$

(141) $\frac{(x-1)^2}{3} - (x - 1) \geq 0$

(142) $\frac{(x-1)^2}{2} + \left(\frac{x-4}{2}\right)^2 \leq 0$

Rozwiąż równanie

(143) $x^3 - x^2 - x + 1 = 0$

(144) $x^3 + 2x^2 - x - 2 = 0$

(145) $x^3 - 2x^2 - x + 2 = 0$

(146) $x^3 + x^2 - 9x - 9 = 0$

(147) $-4x^3 + 4x^2 + 4x - 4 = 0$

(148) $16x^3 - 4x^2 - 4x + 1 = 0$

(149) $3x^3 - 6x^2 - 48x + 96 = 0$

(150) $x^3 + 3x^2 - 9x - 27 = 0$

(151) $x^3 - 2x^2 - 3x + 6 = 0$

(152) $2x^3 - 8x^2 - 8x + 32 = 0$

(153) $x^3 - x^2 - x - 1 = 0$

(154) $x^3 + x^2 + x + 1 = 0$

(155) $x^3 - 2x^2 + 4x - 8 = 0$

(156) $4x^3 + 2x^2 - 2x - 1 = 0$

(157) $x^3 - 7x^2 - 7x + 49 = 0$

(158) $3x^3 - x = 0$

Znajdź różnicę $r$ oraz $n$-ty wyraz ciągu arytmetycznego $a_n$ mając dane

(159) $a_2 = 3,\ a_6 = 11,\ n = 4$

(160) $a_3 = 1,\ a_7 = 9,\ n = 1$

(161) $a_4 = 3,\ a_9 = 9,\ n = 5$

(162) $a_1 = 30,\ a_8 = 90,\ n = 3$

(163) $a_7 = 21,\ a_{14} = 3,\ n = 5$

(164) $a_{14} = 60,\ a_{19} = 35,\ n = 10$

(165) $a_2 = 3,\ a_7 = -12,\ n = 5$

(166) $a_{13} = 100,\ a_{17} = 90,\ n = 10$

Znajdź $n$-ty wyraz ciągu arytmetycznego $a_n$ mając dane

(167) $a_2 = 3,\ r = 11,\ n = 4$

(168) $a_6 = 1,\ r = 9,\ n = 1$

(169) $a_4 = 3,\ r = 4,\ n = 10$

(170) $a_1 = 32, r = \frac{1}{2},\ n = 7$

(171) $a_7 = -10,\ r = 3,\ n = 4$

(172) $a_{11} = 60, r = \frac{3}{4},\ n = 16$

(173) $a_3 = -\frac{2}{3},\ r = 3,\ n = 9$

(174) $a_{12} = -60, r = -15,\ n = 18$

Znajdź iloraz $q$ oraz $n$-ty wyraz ciągu geometrycznego $a_n$ mając dane

(175) $a_2 = 3,\ a_6 = 48,\ n = 8$

(176) $a_3 = 2,\ a_{18} = 9,\ n = 2$

(177) $a_4 = 8,\ a_7 = 27,\ n = 10$

(178) $a_1 = 60,\ a_4 = 7\frac{1}{2},\ n = 5$

(179) $a_7 = 21,\ a_{10} = \frac{7}{9},\ n = 5$

(180) $a_{10} = 600,\ a_{13} = 177\frac{7}{9},\ n = 8$

(181) $a_2 = 4,\ a_6 = 128,\ n = 9$

(182) $a_2 = 1,\ a_5 = 16,\ n = 7$