Usuń niewymierność z mianownika

$$(1) \quad \frac{1}{\sqrt{2}}$$

(2) 
$$\frac{1}{\sqrt{3}}$$

(3) 
$$\frac{1}{\sqrt{7}}$$

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

$$(5) \quad \frac{\sqrt{2}}{\sqrt{3}}$$

$$(6) \quad \frac{\sqrt{2}+1}{\sqrt{5}}$$

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

$$(8) \quad \frac{\sqrt{7}-2}{\sqrt{2}}$$

$$(9) \quad \frac{2 - \sqrt{11}}{\sqrt{3}}$$

$$(10) \quad \frac{3\sqrt{3}}{\sqrt{2}}$$

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

$$(12) \ \frac{-\sqrt{7}-1}{-\sqrt{2}}$$

(13) 
$$\frac{1}{\sqrt{2}+1}$$

(14) 
$$\frac{1}{\sqrt{2}-1}$$

(15) 
$$\frac{\sqrt{2}}{\sqrt{5}-1}$$

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

$$(17) \quad \frac{2\sqrt{3} - 4}{1 - \sqrt{2}}$$

$$(18) \quad \frac{\frac{1}{2} + \sqrt{2}}{\sqrt{2} - 2}$$

(19) 
$$\frac{\sqrt{2} - \sqrt{3}}{\sqrt{5} - \sqrt{7}}$$

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

Oblicz

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

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

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

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

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

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

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

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

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

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

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

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

Narysuj wykres funkcji

$$(37) \ y = x$$

(38) 
$$y = 2x$$

(38) 
$$y = 2x$$
 (39)  $y = 3x$ 

(40) 
$$y = \frac{1}{2}x$$
 (41)  $y = \frac{1}{3}x$  (42)  $y = x + 1$ 

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

$$(42) \quad y = x + 1$$

$$(43) y = x + 2$$

$$(44) \quad y = x - 2$$

(43) 
$$y = x + 2$$
 (44)  $y = x - 2$  (45)  $y = 2x - 1$ 

$$(46) \ \ y = 3x - 2$$

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

(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)  $y = -2x$ 

(50) 
$$y = -x$$

(51) 
$$y = -2x$$

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

(52) 
$$y = -3x - 2$$
 (53)  $y = -\frac{1}{2}x - 4$  (54)  $y = 2$ 

$$(54) \quad y = 2$$

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

$$(56) \quad x \mapsto x - 2$$

(55) 
$$g(t) = 3t + 1$$
 (56)  $x \mapsto x - 2$  (57)  $t \mapsto -2 - 2t$ 

(58) 
$$f(x) = 0$$

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

(58) 
$$f(x) = 0$$
 (59)  $2y = 4x - 2$  (60)  $y = x \cdot \sqrt{2} - 1$ 

Rozwiąż równanie

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

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

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

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

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

$$(76) \ \frac{x}{\sqrt[3]{2}} \cdot 2^{\frac{4}{3}} = \frac{4^3}{2^{2\frac{1}{2}}} - 23$$

## Zaznacz na osi liczbowej

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

$$(78) x \in (1,3)$$

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

$$(80) \quad x \in (-\infty, 1)$$

(81) 
$$x \in (-\infty, \frac{3}{2})$$

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

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

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

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

(86) 
$$x \in \langle 1, 5 \rangle \cap \langle 2, 10 \rangle$$

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

$$(88) \quad x \in (-\infty, 5) \cup (2, 7)$$

$$(89) \quad x \in (-3, 1) \cup (1, \infty)$$

$$(89) \quad x \in (-3, 1) \cup (1, \infty) \qquad (90) \quad x \in (-\infty, 3) \cap (1, \infty)$$

$$(91) x \in (-7,1) \cap (5,\infty)$$

$$(92) x \in (0,4) \cup \{6\}$$

$$(93) \ x \in (-1,1) \cap \{0\}$$

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