

2. Установить соответствие между заданными числами и множествами, которым они принадлежат.

1. $x_1=3, x_2=\sqrt{2}, x_3=0.3;$
 A={ $x \in \mathbb{Z} | -2 < x < 3$ },
 B={ $x \in \mathbb{N} | -5 \leq x \leq 3$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -2 < x < 3$ },
 D={ $x \in \mathbb{Q} | -1 \leq x \leq 2$ },

2. $x_1=1, x_2=\sqrt{3}, x_3=-5;$
 A={ $x \in \mathbb{Z} | -7 < x < 1$ },
 B={ $x \in \mathbb{N} | -5 < x < 1$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -5 < x < 1$ },
 D={ $x \in \mathbb{Q} | -5 < x \leq 1$ },

3. $x_1=0.4, x_2=\sqrt{2}, x_3=3;$
 A={ $x \in \mathbb{Z} | -2 < x < 3$ },
 B={ $x \in \mathbb{N} | -2 < x < 4$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -3 < x < 3$ },
 D={ $x \in \mathbb{Q} | 0 < x < 3$ },

4. $x_1=-2, x_2=\sqrt{6}, x_3=0.3;$
 A={ $x \in \mathbb{N} | -3 < x < 2$ },
 B={ $x \in \mathbb{R} \setminus \mathbb{Q} | -2 < x < 3$ },
 C={ $x \in \mathbb{Z} | -3 \leq x < 3$ },
 D={ $x \in \mathbb{Q} | -2 < x < 2$ },

5. $x_1=2, x_2=0.5, x_3=\sqrt{5};$
 A={ $x \in \mathbb{Z} | 0.5 < x \leq 3$ },
 B={ $x \in \mathbb{N} | -2 < x < 2$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | 0 < x < 3$ },
 D={ $x \in \mathbb{Q} | -2 < x < 2$ },

6. $x_1=0.7, x_2=-3, x_3=\sqrt{2};$
 A={ $x \in \mathbb{N} | -3 \leq x \leq 3$ },
 B={ $x \in \mathbb{R} \setminus \mathbb{Q} | 0.7 \leq x < 2$ },
 C={ $x \in \mathbb{Z} | -3 \leq x \leq \sqrt{2}$ },
 D={ $x \in \mathbb{Q} | -3 < x < 1$ },

7. $x_1=\sqrt{5}, x_2=-2, x_3=0.2;$
 A={ $x \in \mathbb{Z} | -2 \leq x < 5$ },
 B={ $x \in \mathbb{N} | -2 \leq x < 3$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | 0.2 \leq x < 3$ },
 D={ $x \in \mathbb{Q} | 0 < x < \sqrt{5}$ },

8. $x_1=0.5, x_2=-\sqrt{5}, x_3=2;$
 A={ $x \in \mathbb{Z} | -\sqrt{5} \leq x < 3$ },
 B={ $x \in \mathbb{N} | -3 < x \leq 1$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -5 \leq x < 2$ },
 D={ $x \in \mathbb{Q} | -\sqrt{5} \leq x < 2$ },

9. $x_1=-0.4, x_2=1, x_3=\sqrt{7};$
 A={ $x \in \mathbb{R} \setminus \mathbb{Q} | -0.4 \leq x < 3$ },
 B={ $x \in \mathbb{N} | -3 \leq x \leq \sqrt{7}$ },
 C={ $x \in \mathbb{Z} | 1 < x \leq 3$ },
 D={ $x \in \mathbb{Q} | -4 < x < 2$ },

10. $x_1=0, x_2=2.3, x_3=\sqrt{7};$
 A={ $x \in \mathbb{R} \setminus \mathbb{Q} | 2.3 \leq x < 3$ },
 B={ $x \in \mathbb{N} | -3 < x < 3$ },
 C={ $x \in \mathbb{Z} | -3 < x \leq \sqrt{7}$ },
 D={ $x \in \mathbb{Q} | 0 < x \leq 3$ },

11. $x_1=-4, x_2=\sqrt{8}, x_3=1.1;$
 A={ $x \in \mathbb{Z} | -5 \leq x \leq 3$ },
 B={ $x \in \mathbb{N} | -4 \leq x \leq 1.1$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -4 \leq x \leq 3$ },
 D={ $x \in \mathbb{Q} | -4 < x \leq 8$ },

12. $x_1=-1.2, x_2=-\sqrt{8}, x_3=5;$
 A={ $x \in \mathbb{Z} | -1.2 \leq x < 5$ },
 B={ $x \in \mathbb{N} | -\sqrt{8} \leq x < 10$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -3 \leq x \leq 5$ },
 D={ $x \in \mathbb{Q} | -4 < x < 5$ },

13. $x_1=2.4, x_2=\sqrt{10}, x_3=3;$
 A={ $x \in \mathbb{R} \setminus \mathbb{Q} | 2.4 \leq x \leq 5$ },
 B={ $x \in \mathbb{N} | -3 \leq x \leq 10$ },
 C={ $x \in \mathbb{Z} | 0 \leq x \leq 5$ },
 D={ $x \in \mathbb{Q} | 0 < x \leq \sqrt{10}$ },

14. $x_1=3.5, x_2=4, x_3=\sqrt{11};$
 A={ $x \in \mathbb{N} | 1 < x < 5$ },
 B={ $x \in \mathbb{Z} | 0 < x < 4$ },
 C={ $x \in \mathbb{Q} | \sqrt{11} \leq x < 4$ },
 D={ $x \in \mathbb{R} \setminus \mathbb{Q} | 0 \leq x \leq 3.5$ },

15. $x_1=0, x_2=-\sqrt{11}, x_3=-4;$
 A={ $x \in \mathbb{N} | -4 \leq x \leq 4$ },
 B={ $x \in \mathbb{R} \setminus \mathbb{Q} | -4 \leq x \leq 0$ },
 C={ $x \in \mathbb{Z} | -4 < x < 3$ },
 D={ $x \in \mathbb{Q} | -6 < x \leq -\sqrt{11}$ },

16. $x_1=1.8, x_2=\sqrt{7}, x_3=-5;$
 A={ $x \in \mathbb{N} | -5 \leq x < 2$ },
 B={ $x \in \mathbb{Q} | -5 < x \leq \sqrt{7}$ },
 C={ $x \in \mathbb{Z} | -7 \leq x \leq \sqrt{7}$ },
 D={ $x \in \mathbb{R} \setminus \mathbb{Q} | -5 \leq x < 3$ },

17. $x_1=-2.9, x_2=\sqrt{10}, x_3=8;$
 A={ $x \in \mathbb{Z} | -2.9 \leq x \leq 10$ },
 B={ $x \in \mathbb{R} \setminus \mathbb{Q} | -3 < x \leq 8$ },
 C={ $x \in \mathbb{Q} | -2 < x \leq 8$ },
 D={ $x \in \mathbb{R} | -3 < x < \sqrt{10}$ },

18. $x_1=2.5, x_2=2, x_3=-\sqrt{5};$
 A={ $x \in \mathbb{R} | -2 < x < \sqrt{5}$ },
 B={ $x \in \mathbb{N} | -\sqrt{5} < x < 2$ },
 C={ $x \in \mathbb{Q} | 2 < x < 5$ },
 D={ $x \in \mathbb{R} \setminus \mathbb{Q} | -3 < x \leq 2.5$ },

19. $x_1=\sqrt{13}, x_2=3.8, x_3=3;$
 A={ $x \in \mathbb{R} | -5 < x < 3.8$ },
 B={ $x \in \mathbb{N} | -4 \leq x \leq \sqrt{13}$ },
 C={ $x \in \mathbb{Q} | \sqrt{13} \leq x \leq 3.8$ },
 D={ $x \in \mathbb{R} \setminus \mathbb{Q} | 3 < x < \sqrt{13}$ },

20. $x_1=\sqrt{14}, x_2=6, x_3=3.7;$
 A={ $x \in \mathbb{R} | 3.7 \leq x < \sqrt{14}$ },
 B={ $x \in \mathbb{R} | 0 < x < 6$ },
 C={ $x \in \mathbb{Z} | -6 \leq x < 7.2$ },
 D={ $x \in \mathbb{R} \setminus \mathbb{Q} | 3.7 < x \leq 6$ },

21. $x_1=\sqrt{15}, x_2=-3, x_3=4;$
 A={ $x \in \mathbb{R} \setminus \mathbb{Q} | -3 \leq x \leq 4$ },
 B={ $x \in \mathbb{R} | -3 \leq x < 4$ },
 C={ $x \in \mathbb{Q} | -\sqrt{15} < x < 4$ },
 D={ $x \in \mathbb{N} | \sqrt{15} \leq x \leq 9$ },

22. $x_1=-1.5, x_2=5, x_3=\sqrt{17};$
 A={ $x \in \mathbb{Z} | -1.5 \leq x < 10$ },
 B={ $x \in \mathbb{N} | -2 < x < 5$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -1.5 \leq x \leq 5$ },
 D={ $x \in \mathbb{Q} | -2 < x < 4$ },

23. $x_1=-\sqrt{20}, x_2=-5, x_3=1.3;$
 A={ $x \in \mathbb{Z} | -6 < x < 1.3$ },
 B={ $x \in \mathbb{Q} | -\sqrt{20} \leq x < 2$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -5 \leq x \leq 2$ },
 D={ $x \in \mathbb{N} | -5 < x \leq 1.3$ },

24. $x_1=7, x_2=-2.5, x_3=\sqrt{37};$
 A={ $x \in \mathbb{R} | -2.5 \leq x < 6$ },
 B={ $x \in \mathbb{N} | -3 \leq x \leq \sqrt{37}$ },
 C={ $x \in \mathbb{R} \setminus \mathbb{Q} | -2 \leq x \leq 7$ },
 D={ $x \in \mathbb{Z} | \sqrt{37} \leq x < 37$ },

25. $x_1=-5, x_2=4.5, x_3=\sqrt{50};$
 $A=\{x \in \mathbb{R} \mid -5 < x < 7\},$
 $B=\{x \in \mathbb{N} \mid -5 \leq x \leq \sqrt{50}\},$
 $C=\{x \in \mathbb{Z} \mid -\sqrt{50} < x < 5\},$
 $D=\{x \in \mathbb{R} \setminus \mathbb{Q} \mid -5 \leq x \leq 50\},$

26. $x_1=0.7, x_2=\sqrt{15}, x_3=-3;$
 $A=\{x \in \mathbb{R} \setminus \mathbb{Q} \mid -3 \leq x \leq 4\},$
 $B=\{x \in \mathbb{R} \mid -10 < x < 0.7\},$
 $C=\{x \in \mathbb{N} \mid -3 \leq x \leq 4\},$
 $D=\{x \in \mathbb{Q} \mid -3 < x \leq \sqrt{15}\},$

27. $x_1=2.7, x_2=\sqrt{39}, x_3=-1;$
 $A=\{x \in \mathbb{Z} \mid -2 < x \leq \sqrt{39}\},$
 $B=\{x \in \mathbb{N} \mid -1 \leq x < 2.7\},$
 $C=\{x \in \mathbb{R} \setminus \mathbb{Q} \mid -2 < x < 7\},$
 $D=\{x \in \mathbb{Q} \mid -1 \leq x < 2\},$

29. $x_1=4.1, x_2=\sqrt{2}, x_3=-2;$
 $A=\{x \in \mathbb{Z} \mid -4 < x \leq 4.1\},$
 $B=\{x \in \mathbb{Q} \mid -2 < x \leq 5\},$
 $C=\{x \in \mathbb{R} \mid -2 < x < 1\},$
 $D=\{x \in \mathbb{R} \mid -3 < x \leq 2\},$

28. $x_1=3.3, x_2=-3, x_3=\sqrt{15};$
 $A=\{x \in \mathbb{Z} \mid -4 \leq x \leq \sqrt{15}\},$
 $B=\{x \in \mathbb{N} \mid -3 \leq x < 5\},$
 $C=\{x \in \mathbb{Q} \mid 2 < x \leq \sqrt{15}\},$
 $D=\{x \in \mathbb{R} \setminus \mathbb{Q} \mid -3 \leq x \leq 4\},$

30. $x_1=5.5, x_2=-5, x_3=\sqrt{18};$
 $A=\{x \in \mathbb{R} \mid -5 \leq x \leq 5.5\},$
 $B=\{x \in \mathbb{N} \mid -10 \leq x \leq 6\},$
 $C=\{x \in \mathbb{Z} \mid -7 < x \leq 5.5\},$
 $D=\{x \in \mathbb{Q} \mid -5 < x < 18\}.$

3. Заданы три комплексных числа z_1, z_2, z_3 . Вычислить z в алгебраической форме.

1. $z = \frac{z_1 - z_2}{z_3},$

$z_1=2+3i, z_2=1-i, z_3=-2-3i.$

2. $z = \frac{z_1^2 + 2z_2}{z_3},$

$z_1=2+3i, z_2=1-i, z_3=-2-3i.$

3. $z = z_1 \cdot z_2 + 3z_3,$

$z_1=1+3i, z_2=4+2i, z_3=-4+2i.$

4. $z = \frac{z_2}{z_1} + 3iz_3,$

$z_1=1+3i, z_2=4+2i, z_3=-4+2i.$

5. $z = \frac{z_1}{z_2} + 3z_3, z_1=1-2i, z_2=1+3i, z_3=3+2i.$

6. $z = \frac{z_1}{z_1} + iz_2, z_1=1-2i, z_2=1+3i, z_3=3+2i.$

7. $z = \frac{2z_1}{z_1} + (1-i)z_2,$

$z_1=2+3i, z_2=1+2i, z_3=-2+3i.$

8. $z = \frac{z_1 + 2z_3}{z_2},$

$z_1=2+3i, z_2=1+2i, z_3=-2+3i.$

9. $z = \frac{z_1 + 3z_2}{1 \cdot z_3},$

$z_1=3-i, z_2=2+i, z_3=5-2i.$

10. $z = \frac{2z_2 - 3z_3}{z_1},$

$z_1=3-i, z_2=2+i, z_3=5-2i.$

11. $z = 2 \frac{z_1}{z_2} + 3 \frac{z_2}{z_3},$

$z_1=2+3i, z_2=3-2i, z_3=1+i.$

12. $z = \frac{z_1 z_3}{z_2},$

$z_1=2+3i, z_2=3-2i, z_3=1+i.$

13. $z = 3z_1 + 2iz_2 + z_3,$

$z_1=2+5i, z_2=5-2i, z_3=2i.$

14. $z = \frac{-2(z_1 z_2)}{z_3},$

$z_1=2+5i, z_2=5-2i, z_3=2i.$

15. $z = 4z_1 + \frac{z_2}{2z_3},$

$z_1=3-5i, z_2=2+5i, z_3=2+i.$

16. $z = z_1^2 + 2z_2 + z_3,$

$z_1=3-5i, z_2=2+5i, z_3=2+i.$

17. $z = 2z_1 + z_2^2 + 3z_3,$

$z_1=1+5i, z_2=2-4i, z_3=2-3i.$

18. $z = \frac{z_3 + z_2^2}{z_1},$

$z_1=1+5i, z_2=2-4i, z_3=2-3i.$

19. $z = \frac{z_1 + 2z_3}{z_2},$

$z_1=2+4i, z_2=3-4i, z_3=3-2i.$

20. $z = \frac{z_2^2}{2z_1 + z_3},$

$z_1=2+4i, z_2=3-4i, z_3=3-2i.$

$$21. z = \frac{iz_1 + 2z_2}{z_3},$$

$$z_1 = 1+6i, z_2 = 2-4i, z_3 = 3i.$$

$$22. z = 2z_1^2 + 3\frac{z_2}{z_3},$$

$$z_1 = 2-i, z_2 = 3+i, z_3 = 4+2i.$$

$$23. z = \frac{3z_1^2 + z_3}{i \cdot z_2},$$

$$z_1 = 2-i, z_2 = 3+i, z_3 = 4+2i.$$

$$24. z = 3z_3^2 + 2z_2 + iz_1,$$

$$z_1 = 3+7i, z_2 = 1-i, z_3 = 2+3i.$$

$$25. z = \frac{z_1^2}{z_2 \cdot z_3},$$

$$z_1 = 3+7i, z_2 = 1-i, z_3 = 2+3i.$$

$$26. z = \frac{2i \cdot z_1 \cdot z_3}{z_2},$$

$$z_1 = 3-7i, z_2 = -1+i, z_3 = 2-3i.$$

$$27. z = \frac{2z_1 \cdot z_2}{z_3},$$

$$z_1 = 3-7i, z_2 = -1+i, z_3 = 2-3i.$$

$$28. z = 3z_2 + 2\frac{z_3}{z_1}$$

$$z_1 = 2-3i, z_2 = 3+2i, z_3 = 1-i.$$

$$29. z = \frac{z_1^2}{2i \cdot z_2 \cdot z_3},$$

$$z_1 = 2-3i, z_2 = 3+2i, z_3 = 1-i.$$

$$30. z = \frac{z_2 \cdot z_3}{3z_1},$$

$$z_1 = 2-4i, z_2 = 3+4i, z_3 = 3+2i.$$

4. Найти предел.

$$1. \lim_{x \rightarrow 3} \frac{x^3 - 6x^2 + 3x + 18}{2x^2 - 7x + 3}$$

$$2. \lim_{x \rightarrow 3} \frac{x^4 - 2x^3 - 27}{2x^2 + x - 21}$$

$$3. \lim_{x \rightarrow 2} \frac{x^4 - 5x - 6}{3x^2 + x - 14}$$

$$4. \lim_{x \rightarrow 2} \frac{x^3 - 32}{5x^2 + 3x - 26}$$

$$5. \lim_{x \rightarrow -1} \frac{2x^4 - x^2 + 2x + 1}{-x^2 + 6x + 7}$$

$$6. \lim_{x \rightarrow -2} \frac{3x^4 + 2x^2 + 20x - 16}{5x^2 + 8x - 4}$$

$$7. \lim_{x \rightarrow 3} \frac{x^4 - 2x^3 - 27}{3x^2 + 2x - 33}$$

$$8. \lim_{x \rightarrow 2} \frac{x^4 - 16}{8x^2 - 13x - 6}$$

$$9. \lim_{x \rightarrow -2} \frac{x^5 + 2x^4 + 10x - 20}{x^3 + 8}$$

$$10. \lim_{x \rightarrow 3} \frac{x^4 - 7x^2 + 4x - 6}{2x^2 + 7x + 3}$$

$$11. \lim_{x \rightarrow -3} \frac{x^3 - 7x^2 + 15x - 9}{x^3 - 8x^2 + 21x - 18}$$

$$12. \lim_{x \rightarrow 1} \frac{x^4 + x^3 - 2x^2 - 3x - 1}{x^4 + 2x^3 + 2x^2 + 2x + 1}$$

$$13. \lim_{x \rightarrow 3} \frac{x^3 - 4x^2 - 3x + 18}{x^3 - 5x^2 + 3x + 9}$$

$$14. \lim_{x \rightarrow -1} \frac{x^3 + 2x^2 + 5x + 4}{x^3 - x^2 - 3x - 1}$$

$$15. \lim_{x \rightarrow -1} \frac{(2x^2 - x - 1)^2}{x^3 - 7x^2 + 11x - 5}$$

$$16. \lim_{x \rightarrow -1} \frac{x^3 + 5x^2 + 7x + 3}{x^4 + 4x^2 + 5x}$$

$$17. \lim_{x \rightarrow -1} \frac{x^3 + 5x^2 + 7x + 3}{x^3 + 4x^2 + 5x + 2}$$

$$18. \lim_{x \rightarrow -1} \frac{x^3 + 2x^2 - x - 2}{3x^2 + 5x + 2}$$

$$19. \lim_{x \rightarrow -2} \frac{x^3 + 5x^2 + 8x + 4}{x^3 + 3x^2 - 4}$$

$$20. \lim_{x \rightarrow -1} \frac{x^3 + 4x^2 + 5x + 2}{x^3 - 3x - 2}$$

$$21. \lim_{x \rightarrow 2} \frac{x^3 - 6x^2 + 12x - 8}{x^3 - 3x^2 - 4}$$

$$22. \lim_{x \rightarrow -2} \frac{x^3 + 5x^2 + 8x + 4}{x^3 + 7x^2 + 16x + 12}$$

$$23. \lim_{x \rightarrow 2} \frac{8x^3 - 1}{2x^2 + 3x - 2}$$

$$24. \lim_{x \rightarrow 1} \frac{x^3 - 2x - 1}{x^4 + 2x + 1}$$

$$25. \lim_{x \rightarrow -3} \frac{x^3 + 4x^2 + 2x - 3}{x^2 + x - 6}$$

$$26. \lim_{x \rightarrow -4} \frac{2x^2 + 6x - 8}{x^3 + 3x^2 + 16}$$

$$27. \lim_{x \rightarrow 1} \frac{x^3 + 2x^2 - x - 2}{2x^4 - x - 3}$$

$$28. \lim_{x \rightarrow 2} \frac{x^3 - 5x^2 + 8x - 43}{x^3 - 3x^2 + 4}$$

$$29. \lim_{x \rightarrow 3} \frac{3x^4 - 7x^2 - 5x - 3}{5x^2 - 14x - 3}$$

$$30. \lim_{x \rightarrow -2} \frac{2x^2 + 7x + 2}{x^3 + 3x^2 + 8x + 12}$$

5. Найти предел.

$$1. \lim_{x \rightarrow \infty} \frac{2x^2 + 6x - 1}{x^2 + 4}$$

$$2. \lim_{x \rightarrow \infty} \frac{4x^3 - 3x^2 + x - 1}{3x^3 + 2x^2 - 1}$$

$$3. \lim_{x \rightarrow \infty} \frac{5x^3 - 4x^2 + x - 1}{2x^2 + x + 1}$$

$$4. \lim_{x \rightarrow \infty} \frac{4x^3 + 3x^2 + x + 2}{x^4 + 1}$$

$$5. \lim_{x \rightarrow \infty} \frac{2x^2 + 5x - 7}{3x^2 - x - 2}$$

$$6. \lim_{x \rightarrow \infty} \frac{x^4 + 2x^2 - 1}{x + 3x^2 - 2x^4}$$

$$7. \lim_{x \rightarrow \infty} \frac{5x^2 - x^3}{x^2 + 3x - 16}$$

$$8. \lim_{x \rightarrow \infty} \frac{3x^2 - 2x^3}{5x^3 + 7x - 1}$$

$$9. \lim_{x \rightarrow \infty} \frac{2x^4 + x^3 + 1}{3x^2 + x^4}$$

$$10. \lim_{x \rightarrow \infty} \frac{5x^4 + 3x^2 - 18}{10x^4 - 18x^2 + 3}$$

$$11. \lim_{x \rightarrow \infty} \frac{x^4 - 7x^2 - 5x - 3}{5x^2 - 14x + 3}$$

$$12. \lim_{x \rightarrow \infty} \frac{5x^2 - 3}{5x^2 + 4x^3 + 3x^4}$$

$$13. \lim_{x \rightarrow \infty} \frac{3x^2 - 2x^3}{x^2 - 14x + 3}$$

$$14. \lim_{x \rightarrow \infty} \frac{x^4 - 7x^2 - 5x - 3}{x^4 - 4x^5}$$

$$15. \lim_{x \rightarrow \infty} \frac{2x^4 + 4x^2 - 1}{x - 3x^2 - x^4}$$

$$16. \lim_{x \rightarrow \infty} \frac{2x^2 - 3x + 1}{3x^2 + 4x^3 + x^4}$$

$$17. \lim_{x \rightarrow \infty} \frac{2x^3 - x + 3}{4x^2 + x^4}$$

$$18. \lim_{x \rightarrow \infty} \frac{6x^2 - x + 3}{4x^2 + x^3}$$

$$19. \lim_{x \rightarrow \infty} \frac{2x^2 - x^3}{3x^2 - 5x - 16}$$

$$20. \lim_{x \rightarrow \infty} \frac{7x^4 - 2x^2 - 1}{x + 3x^2 - 2x^4}$$

$$21. \lim_{x \rightarrow \infty} \frac{5x^2 - 2x + 11}{x^2 + 3x^3 - 2x^4}$$

$$22. \lim_{x \rightarrow \infty} \frac{2 - 2x + 5x^2 + 9x^3}{2 + x^2 + 3x^3 - 2x^4}$$

$$23. \lim_{x \rightarrow \infty} \frac{3 + 2x^2 - x^3}{3x^2 - 4x - 15}$$

$$24. \lim_{x \rightarrow \infty} \frac{21x^2 - 10x + 7}{x^2 + 2x^3 - 2x^4}$$

$$25. \lim_{x \rightarrow \infty} \frac{x^2 - 2x^3 + 3x^4}{6x^2 + 5x + 14}$$

$$26. \lim_{x \rightarrow \infty} \frac{3 - 2x^2 + 9x^3}{3 + 3x^2 - 2x^4}$$

$$27. \lim_{x \rightarrow \infty} \frac{4x^2 + 5x^3}{4x^2 + 3x - 1}$$

$$28. \lim_{x \rightarrow \infty} \frac{x^2 - 2x^3 + 5x^4}{4x^2 + 2x + 1}$$

$$29. \lim_{x \rightarrow \infty} \frac{x^5 + 3x^4 - 2x^2 + 1}{7x + 3x^2 - 2x^4}$$

$$30. \lim_{x \rightarrow \infty} \frac{x^4 + 2x^3 + x^2 + 3}{7x + 3x^2 - 2x^4}$$

6. Найти предел

$$1. \lim_{x \rightarrow 0} \frac{1 - \cos^3 x}{\operatorname{tg}^2 3x}$$

$$2. \lim_{x \rightarrow 0} \operatorname{tg} 2x \cdot \operatorname{tg} \left(\frac{3\pi}{2} - \frac{x}{2} \right)$$

$$3. \lim_{x \rightarrow \frac{\pi}{6}} \frac{\sqrt{3} - 2 \cos x}{\pi - 6x}$$

$$4. \lim_{x \rightarrow \frac{\pi}{3}} \frac{1 - 2 \cos x}{\pi - 3x}$$

$$5. \lim_{x \rightarrow 0} \frac{\cos(3x^2) - 1}{\sin^4 2x}$$

$$6. \lim_{x \rightarrow 0} \frac{1 - \cos 5x}{1 - \cos 3x}$$

$$7. \lim_{x \rightarrow 1} \frac{\cos\left(\frac{\pi x}{2}\right) - 1}{1 + \sqrt[3]{x}}$$

$$8. \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} - 2 \cos x}{\pi - 4x}$$

$$9. \lim_{x \rightarrow 0} \frac{1 - \cos 4x}{1 - \cos 8x}$$

$$10. \lim_{x \rightarrow 0} \frac{\cos 6x - 1}{x \cdot \operatorname{tg} 2x}$$

$$11. \lim_{x \rightarrow 0} \frac{x \cdot \operatorname{tg} 3x}{\cos x - \cos^3 x}$$

$$12. \lim_{x \rightarrow 0} \frac{\cos 2x - \cos x}{1 - \cos 6x}$$

$$13. \lim_{x \rightarrow 0} \frac{1 - \sqrt{\cos x}}{x \sin^2 \sqrt{x}}$$

$$14. \lim_{x \rightarrow 0} \frac{\operatorname{tg} x - \sin x}{x(1 - \cos 4x)}$$

$$15. \lim_{x \rightarrow \frac{\pi}{3}} \frac{1 - 2 \cos x}{\sin(\pi - 3x)}$$

$$16. \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin\left(x - \frac{\pi}{4}\right)}{\sqrt{2} - 2 \cos x}$$

$$17. \lim_{x \rightarrow 0} \frac{\sqrt{\cos x} - 1}{\sin^2 2x}$$

$$18. \lim_{x \rightarrow 1} (1 - x^2) \operatorname{ctg} \pi x$$

$$19. \lim_{x \rightarrow 0} \frac{1 - \sqrt{\cos x}}{x(1 - \cos \sqrt{x})}$$

$$20. \lim_{x \rightarrow 1} \frac{\cos\left(\frac{\pi(x-2)}{2}\right)}{2 - \sqrt{x+1}}$$

$$21. \lim_{x \rightarrow 0} \frac{\operatorname{tg} 2x - \sin 2x}{\sin^3 x}$$

$$22. \lim_{x \rightarrow 0} \frac{1 - \cos(9x^2)}{\sin^4 3x}$$

$$23. \lim_{x \rightarrow 0} \frac{\sin x - \sin 7x}{\operatorname{tg}(2\pi + 2x)}$$

$$24. \lim_{x \rightarrow \frac{\pi}{3}} \frac{\sin\left(x - \frac{\pi}{3}\right)}{1 - 2 \cos x}$$

$$25. \lim_{x \rightarrow 0} \frac{\sin^2 x - \operatorname{tg}^2 x}{(1 - \cos x)^2}$$

$$26. \lim_{x \rightarrow 0} \frac{\sin\left(\frac{\pi}{6} + x\right) - \sin\left(\frac{\pi}{6} - x\right)}{\operatorname{tg}\left(2\pi\left(x + \frac{1}{2}\right)\right)}$$

$$27. \lim_{x \rightarrow 1} (1 - \cos 3x) \operatorname{ctg}^2 4x$$

$$28. \lim_{x \rightarrow 0} \frac{1 - \cos 4x}{\sin x \cdot \operatorname{tg} 3x}$$

$$29. \lim_{x \rightarrow 0} \frac{\cos x - \cos^3 x}{x \sin 2x}$$

$$30. \lim_{x \rightarrow 0} \frac{1 - \cos 2x}{\cos 7x - \cos 3x}$$