

1. Simplifica al máximo:

- | | | | | | |
|------------------------------|-----------------------------------|------------------------------|----------------------------------|---------------------------------|---------------------------------|
| 1. $\sqrt{756}$ | 2. $\sqrt{600}$ | 3. $\sqrt{750}$ | 4. $\sqrt[3]{972}$ | 5. $\sqrt[4]{672}$ | 6. $\sqrt{1331}$ |
| 7. $\sqrt{1350}$ | 8. $\sqrt[3]{1715}$ | 9. $\sqrt[4]{1250}$ | 10. $2\sqrt{245}$ | 11. $3\sqrt[3]{672}$ | 12. $\sqrt[3]{1372}$ |
| 13. $3\sqrt{540}$ | 14. $\sqrt[4]{1875}$ | 15. $\sqrt[3]{2187}$ | 16. $2\sqrt[3]{640}$ | 17. $3\sqrt[3]{405}$ | 18. $3\sqrt{1134}$ |
| 19. $3\sqrt{1331}$ | 20. $2\sqrt{1014}$ | 21. $3\sqrt{1470}$ | 22. $3\sqrt{1440}$ | 23. $ab\sqrt[3]{24ab^6}$ | 24. $ab\sqrt{27a^5b^4}$ |
| 25. $a^2b\sqrt{90ab^2}$ | 26. $3ab\sqrt{20a^3b}$ | 27. $ab^2\sqrt{56a^2b^3}$ | 28. $ab^2\sqrt{45a^3b^3}$ | 29. $ab^2\sqrt{98a^3b^7}$ | 30. $ab^2\sqrt{54a^2b^7}$ |
| 31. $ab^2\sqrt{98a^6b^8}$ | 32. $2ab\sqrt[3]{81a^6b^6}$ | 33. $3ab^2\sqrt{27ab^6}$ | 34. $2ab\sqrt[3]{54a^2b^9}$ | 35. $2ab^2\sqrt[3]{56a^2b}$ | 36. $a^2b\sqrt[3]{81a^{16}b^4}$ |
| 37. $2ab\sqrt{126a^2b^5}$ | 38. $3ab\sqrt[3]{112a^2b^2}$ | 39. $2ab^2\sqrt{56a^4b^2}$ | 40. $2ab\sqrt[4]{96a^{14}b^8}$ | 41. $ab^2\sqrt[4]{96a^7b^{17}}$ | 42. $2a^2b\sqrt[3]{72ab^{13}}$ |
| 43. $3ab\sqrt[4]{144a^2b^4}$ | 44. $ab\sqrt[4]{400a^{12}b^{16}}$ | 45. $a^2b^2\sqrt{108a^2b^3}$ | 46. $a^2b\sqrt[4]{160a^{13}b^7}$ | 47. $2ab\sqrt[3]{168a^{12}b^3}$ | 48. $2ab\sqrt[4]{144a^{10}b^4}$ |

2. Simplifica al máximo:

- | | | | | |
|------------------------------|-------------------------------|-----------------------------------|---------------------------------|------------------------------------|
| 1. $a\sqrt{4a-4}$ | 2. $a^2\sqrt{4a-8}$ | 3. $2a^2\sqrt{9-9a}$ | 4. $3a\sqrt{27a-27}$ | 5. $3a^2\sqrt{18a-18}$ |
| 6. $2a\sqrt{4a^2-8a+4}$ | 7. $2a^2\sqrt{9a^2-18a+9}$ | 8. $3ab^2\sqrt{6b^{10}-8ab^{10}}$ | 9. $3a^2b^2\sqrt{8ab^7-8b^7}$ | 10. $a^2b^2\sqrt{8ab^3+16b^3}$ |
| 11. $2ab\sqrt{27ab^7+27b^7}$ | 12. $3a^2\sqrt{27a^2-54a+27}$ | 13. $3a^2b\sqrt{16ab^8+16b^8}$ | 14. $2a^2b^2\sqrt{a^2b+4ab+4b}$ | 15. $ab^2\sqrt{4a^2b^8+4ab^8+b^8}$ |

3. Realiza la operación:

- | | | | |
|---|---|--|---|
| 1. $-3\sqrt[4]{8}\cdot 2\sqrt{5}\sqrt{5}$ | 2. $-3\sqrt{2}\cdot 3\sqrt[6]{2}\sqrt[3]{2}$ | 3. $\sqrt[6]{96}\cdot 3\sqrt{6}\cdot 3\sqrt[3]{9}$ | 4. $\sqrt[3]{100}\sqrt{10}\cdot 2\sqrt[6]{2}$ |
| 5. $\sqrt[3]{225}\cdot 2\sqrt{15}\sqrt[6]{5}$ | 6. $3\sqrt[3]{10}\sqrt[6]{160}\sqrt{10}$ | 7. $3\sqrt[6]{2}\cdot 3\sqrt[3]{18}(-\sqrt{3})$ | 8. $-3\sqrt{10}\cdot 2\sqrt[4]{10}\cdot 3\sqrt{5}$ |
| 9. $3\sqrt{10}(-3\sqrt[4]{2})3\sqrt{5}$ | 10. $2\sqrt[4]{5}\cdot 3\sqrt{5}\cdot 2\sqrt[4]{250}$ | 11. $-3\sqrt[6]{32}(-3\sqrt{2})(-\sqrt[3]{5})$ | 12. $-2\sqrt[6]{32}(-2\sqrt{10})3\sqrt[3]{50}$ |
| 13. $-2\sqrt{2}(-2\sqrt[4]{24})(-3\sqrt[4]{8})$ | 14. $3a\sqrt{2}\cdot 2a\sqrt[6]{32a}\cdot a^2\sqrt[3]{a}$ | 15. $3a^2\sqrt[6]{3}\cdot 3a^2\sqrt[3]{9a}\cdot a^2\sqrt{3}$ | 16. $-a^2\sqrt{3}(-a\sqrt{a})(-a^2\sqrt[4]{a})$ |
| 17. $3a\sqrt{a}(-a^2\sqrt{5})3a^2\sqrt[4]{5a}$ | 18. $2a\sqrt[6]{5a}(-2a^2\sqrt[3]{5})2a\sqrt{a}$ | 19. $2a^2\sqrt[6]{a^5}(-a\sqrt{2})2a\sqrt[3]{2a^2}$ | 20. $a^2b\sqrt[4]{ab^3}\cdot ab^2\sqrt{b}(-ab\sqrt{b})$ |

4. Realiza la operación:

- | | | | | | | |
|---------------------------|---------------------------|----------------------------|----------------------------|-----------------------------|-------------------------|---------------------------|
| 1. $(\sqrt[4]{5})^7$ | 2. $(\sqrt[3]{9})^2$ | 3. $(\sqrt[6]{3})^9$ | 4. $(\sqrt[6]{3})^3$ | 5. $(\sqrt[4]{8})^8$ | 6. $(\sqrt[4]{3})^6$ | 7. $(\sqrt[6]{10})^2$ |
| 8. $(\sqrt[3]{36})^5$ | 9. $(-3\sqrt[3]{25})^2$ | 10. $(a\sqrt[3]{a})^5$ | 11. $(a^2\sqrt{a})^3$ | 12. $(-a^2\sqrt{a})^4$ | 13. $(3a\sqrt{5a})^2$ | 14. $(a\sqrt[3]{3a^2})^6$ |
| 15. $(2a\sqrt[4]{a^3})^3$ | 16. $(a^2\sqrt[3]{4a})^2$ | 17. $(-a\sqrt[6]{5a^5})^3$ | 18. $(3a\sqrt[6]{5a^5})^3$ | 19. $(2a\sqrt[4]{27a^3})^3$ | 20. $(ab\sqrt[4]{a})^8$ | 21. $(2ab\sqrt[3]{a})^4$ |

5. Agrupa en una sola raíz:

- | | | | | | | |
|----------------------------------|----------------------------------|--------------------------------|-----------------------------------|----------------------------------|------------------------------------|-------------------------------------|
| 1. $\sqrt[3]{6\sqrt{6}}$ | 2. $\sqrt[3]{25}$ | 3. $\sqrt[5]{4\sqrt{2}}$ | 4. $\sqrt[3]{2\sqrt{2}}$ | 5. $\sqrt{\sqrt[5]{25}}$ | 6. $\sqrt[5]{3\sqrt[4]{3}}$ | 7. $\sqrt[3]{9\sqrt[4]{3}}$ |
| 8. $\sqrt{\sqrt[3]{100}}$ | 9. $\sqrt{2\sqrt[5]{50}}$ | 10. $\sqrt{\sqrt[3]{900}}$ | 11. $\sqrt[4]{4\sqrt[5]{16}}$ | 12. $\sqrt{3\sqrt[3]{75}}$ | 13. $\sqrt[4]{5\sqrt[3]{45}}$ | 14. $\sqrt[3]{2\sqrt[5]{54}}$ |
| 15. $\sqrt{2\sqrt[5]{200}}$ | 16. $\sqrt[3]{2\sqrt[4]{108}}$ | 17. $\sqrt[5]{125\sqrt[3]{4}}$ | 18. $\sqrt[3]{30\sqrt{30}}$ | 19. $\sqrt{2\sqrt[3]{2a^2}}$ | 20. $\sqrt[3]{3a\sqrt{3a}}$ | 21. $\sqrt[3]{2\sqrt[4]{4a^3}}$ |
| 22. $\sqrt[3]{2a\sqrt[5]{2a}}$ | 23. $\sqrt[5]{9a\sqrt[4]{9a}}$ | 24. $\sqrt{a\sqrt[5]{144a}}$ | 25. $\sqrt[5]{9a^2\sqrt{3a}}$ | 26. $\sqrt{2a\sqrt[3]{50a}}$ | 27. $\sqrt[4]{8a\sqrt[5]{2a^3}}$ | 28. $\sqrt[4]{4a^3\sqrt[3]{4a}}$ |
| 29. $\sqrt[5]{36a^2\sqrt[6]{a}}$ | 30. $\sqrt[5]{100a^2\sqrt{10a}}$ | 31. $\sqrt{a\sqrt[3]{25ab^2}}$ | 32. $\sqrt[3]{b\sqrt[5]{27a^3b}}$ | 33. $\sqrt{2a\sqrt[5]{2a^3b^2}}$ | 34. $\sqrt[4]{ab^3\sqrt[3]{25ab}}$ | 35. $\sqrt[4]{b\sqrt[5]{25a^2b^3}}$ |

6. Realiza la operación:

1. $\sqrt[6]{3} \cdot 3\sqrt[3]{9}(\sqrt{6})^3$
2. $\sqrt[3]{12}(\sqrt{3})^3 3\sqrt[6]{6}$
3. $3\sqrt[6]{2}(\sqrt{2})^3 2\sqrt[3]{6}$
4. $2\sqrt[4]{54}(\sqrt{2})^3 2\sqrt{2}$
5. $\sqrt{2\sqrt{2}}(-\sqrt{6})2\sqrt[4]{6}$
6. $2\sqrt[3]{2\sqrt{2}}\sqrt[3]{2} \cdot 3\sqrt[6]{2}$
7. $-2\sqrt{5\sqrt{5}}(-\sqrt{5})\sqrt{2}$
8. $-3\sqrt{6} \cdot 2\sqrt{6}\sqrt[4]{6}\sqrt[4]{2}$
9. $\sqrt{3}(-3\sqrt{3\sqrt{3}})2\sqrt{2}$
10. $\sqrt[4]{24}(\sqrt{3})^3(-2\sqrt[4]{3})$
11. $-\sqrt{2} \cdot 3\sqrt[3]{2} \cdot 2\sqrt[3]{4\sqrt{2}}$
12. $\sqrt[6]{5} \cdot 2\sqrt[4]{5\sqrt[3]{5}}(\sqrt{2})^3$
13. $(-2\sqrt{6})^3 2\sqrt[6]{2} \cdot 2\sqrt[3]{6}$
14. $-3\sqrt{5}(\sqrt{5})^3 2\sqrt[4]{125}$
15. $(\sqrt{10})^3 \sqrt{2\sqrt{2}}(-\sqrt[4]{8})$
16. $2\sqrt{3}(-3\sqrt{2\sqrt{6}})3\sqrt[3]{3}$
17. $-(\sqrt{5})^3 3\sqrt[3]{5\sqrt{5}}(-\sqrt[4]{5})$
18. $-3\sqrt[4]{2} \cdot 3\sqrt{2\sqrt{2}}(-\sqrt{5})^3$
19. $\sqrt[3]{4}(-3\sqrt[3]{4\sqrt{10}})(-\sqrt{2})^3$
20. $-3\sqrt[6]{6} \cdot 2\sqrt[3]{6}(-3\sqrt[3]{3\sqrt{3}})$
21. $(\sqrt{2})^3 2\sqrt[3]{12}(-3\sqrt[3]{4\sqrt{2}})$
22. $(\sqrt{2})^3 \sqrt[3]{36\sqrt{6}}(-2\sqrt[3]{12})$
23. $3a\sqrt[3]{a}(-a\sqrt[6]{a})(a\sqrt{3})^3$
24. $a\sqrt{a\sqrt{5a}}(-a\sqrt{a})^3 a^2\sqrt[4]{5}$
25. $a\sqrt{3} \cdot a^2\sqrt[3]{a} \cdot 2a^2\sqrt[3]{a^2\sqrt{a}}$
26. $a\sqrt[4]{2a}(-a^2\sqrt{a})^3 2a\sqrt[4]{2a^3}$
27. $-a^2\sqrt[3]{3}(2a^2\sqrt{a})^3 3a^2\sqrt{3a}$
28. $2a^2\sqrt[3]{a^2\sqrt{a}} \cdot 2a\sqrt{a} \cdot 2a\sqrt[3]{a^2}$

7. Realiza la operación:

1. $\left(\frac{\sqrt{2}}{2}\right)^3 2\sqrt[4]{2}\sqrt[4]{6}$
2. $-\sqrt[4]{2} \cdot \frac{3\sqrt{5}}{5} \left(\frac{\sqrt{5}}{5}\right)^3$
3. $\frac{\sqrt[6]{5}}{5} \cdot \frac{\sqrt[3]{25}}{25} (\sqrt{5})^3$
4. $-\left(\frac{\sqrt{6}}{2}\right)^3 3\sqrt[3]{\frac{2\sqrt[4]{6}}{3}}$
5. $\frac{2\sqrt[3]{9\sqrt{6}}}{3} \sqrt[3]{2} \cdot \frac{2\sqrt{3}}{3}$
6. $-\left(\frac{\sqrt{3}}{3}\right)^3 \frac{2\sqrt[4]{3}}{3} 2\sqrt[4]{3}$
7. $-\sqrt{3} \cdot \frac{2\sqrt{3}\sqrt[3]{15}}{5} \cdot \frac{\sqrt{3}}{3}$
8. $\sqrt{10}\sqrt{10} \frac{\sqrt{2}}{2} \cdot \frac{2\sqrt{10}}{5}$
9. $\frac{\sqrt{3}}{3} \left(-\frac{\sqrt[4]{3}}{3}\right)^3 \sqrt[3]{15\sqrt{15}}$
10. $\frac{3\sqrt[3]{9\sqrt{6}}}{2} \cdot \frac{\sqrt[3]{2}}{2} (-\sqrt{6})^3$
11. $-\frac{3\sqrt{2\sqrt{6}}}{2} \left(\frac{\sqrt{2}}{2}\right)^3 2\sqrt{2}$
12. $3\sqrt[3]{3} \left(\frac{2\sqrt{5}}{5}\right)^3 \frac{3\sqrt{3}\sqrt{3}}{2}$
13. $-3\sqrt[6]{5} \frac{2\sqrt[3]{5\sqrt{5}}}{5} \cdot \frac{\sqrt[3]{20}}{4}$
14. $-\sqrt[3]{5\sqrt{5}} \frac{2\sqrt[3]{25}}{5} \cdot \frac{3\sqrt[6]{2}}{2}$
15. $\left(\frac{\sqrt{3}}{3}\right)^3 \left(-\frac{2\sqrt[3]{9}}{9}\right)^3 \sqrt[4]{4\sqrt{2}}$
16. $\frac{2\sqrt[3]{4\sqrt{10}}}{5} 3\sqrt[3]{4} \left(\frac{\sqrt{2}}{2}\right)^3$
17. $-\frac{3\sqrt[6]{10}}{5} 2\sqrt[3]{2} \frac{3\sqrt[3]{2\sqrt{2}}}{2}$
18. $\frac{3\sqrt[6]{2}}{2} \left(\frac{\sqrt{6}}{6}\right)^3 (-\sqrt[4]{9\sqrt[3]{9}})$
19. $-3\sqrt[4]{27} \frac{\sqrt{3}\sqrt{3}}{3} \left(-\frac{\sqrt{2}}{2}\right)^3$
20. $-2\sqrt[3]{3\sqrt{3}} \frac{3\sqrt[6]{6}}{2} \cdot \frac{3\sqrt[3]{18}}{2}$
21. $\left(\frac{2\sqrt{5}}{5}\right)^3 2\sqrt[4]{10} \frac{3\sqrt{2\sqrt{2}}}{2}$
22. $\sqrt[3]{25} \frac{2\sqrt[3]{9\sqrt{15}}}{15} \left(\frac{\sqrt{15}}{3}\right)^3$
23. $-\left(\frac{\sqrt{6}}{3}\right)^3 3\sqrt[6]{486} \left(-\frac{\sqrt[3]{3}}{3}\right)$
24. $\left(\frac{\sqrt{5}}{5}\right)^3 \left(-\frac{2\sqrt[4]{27}}{27}\right)^3 3\sqrt[4]{27}$
25. $-2a\sqrt{a} \frac{3a\sqrt{a\sqrt{a}}}{2} \cdot \frac{3a\sqrt{a}}{2}$
26. $\frac{a^2\sqrt{5\sqrt{5a}}}{5} \cdot \frac{2a\sqrt[4]{a}}{3} a\sqrt{a}$
27. $3a^2\sqrt[3]{3} \frac{a\sqrt[3]{9a}}{9} \cdot \frac{a\sqrt[3]{a^2\sqrt{3a}}}{3}$
28. $-3a^2\sqrt[6]{a} \left(\frac{a\sqrt{a}}{2}\right)^3 \left(-\frac{3a\sqrt[3]{5a}}{5}\right)$

8. Realiza la operación:

1. $-5-3\sqrt{45}-4\sqrt{20}-1-4\sqrt{80}$
2. $3+2\sqrt{75}+1-5\sqrt{125}-10\sqrt{3}$
3. $-4\sqrt{12}-4\sqrt{27}+3\sqrt{2}+3-2\sqrt{3}$
4. $5\sqrt{150}+1+\sqrt{2}-3\sqrt{24}-4\sqrt{54}$
5. $4-4\sqrt{20}-4\sqrt{27}+\sqrt{12}-4\sqrt{80}$
6. $2\sqrt{6}+3+2\sqrt{150}+2\sqrt{45}-\sqrt{24}$
7. $3\sqrt{8}+3\sqrt{50}-5\sqrt{2}-2\sqrt{12}+\sqrt{8}$
8. $2\sqrt{150}+4\sqrt{50}-3\sqrt{18}-5\sqrt{8}-1$
9. $4\sqrt{75}-3+5\sqrt{6}-2\sqrt{12}-4\sqrt{150}$
10. $2\sqrt{5}-\sqrt{80}-2\sqrt{5}+5\sqrt{80}-2\sqrt{5}$
11. $5\sqrt{20}-\sqrt{48}-2\sqrt{6}+\sqrt{5}-4\sqrt{150}$
12. $4\sqrt{3}-2\sqrt{50}+\sqrt{5}+2\sqrt{80}-5\sqrt{50}$
13. $\sqrt{8}-2\sqrt{125}-4\sqrt{50}-2\sqrt{45}-3\sqrt{8}$
14. $2\sqrt{150}+4\sqrt{6}-5\sqrt{27}-\sqrt{24}-2\sqrt{6}$
15. $-2\sqrt{18}-2\sqrt{3}+3\sqrt{12}-5\sqrt{20}+2\sqrt{2}$
16. $-3\sqrt{96}+3\sqrt{32}-3\sqrt{75}-\sqrt{12}-3\sqrt{6}$
17. $5\sqrt{48}-\sqrt{24}+4\sqrt{27}+5\sqrt{75}-\sqrt{18}$
18. $2\sqrt{12}+2\sqrt{6}-2\sqrt{75}+5\sqrt{125}+5\sqrt{6}$
19. $5\sqrt{80}-4\sqrt{20}+3\sqrt{45}-\sqrt{96}-5\sqrt{20}$
20. $2\sqrt{32}+2\sqrt{80}-4\sqrt{20}-4\sqrt{54}-\sqrt{32}$
21. $-4\sqrt{48}-4\sqrt{125}-6\sqrt{12}-5\sqrt{5}-5\sqrt{6}$
22. $a+4\sqrt{5a^3}+3a\sqrt{80a}-3a$
23. $-3\sqrt{5a}+3\sqrt{48a^2}-4+5a\sqrt{12}$
24. $5\sqrt{32a^3}+4\sqrt{18a^3}+3a\sqrt{80}-1$
25. $2\sqrt{125a^2}+2a+4\sqrt{20a^2}-4\sqrt{5a^2}$
26. $2\sqrt{8a^2}-a\sqrt{2}-5a\sqrt{18}-3a\sqrt{2}-\sqrt{50a^2}$
27. $\sqrt{20a^3}-3a-5\sqrt{12a^2}-\sqrt{48a^2}-5\sqrt{5a^3}$

9. Realiza la operación:

1. $\sqrt{3}(1+2\sqrt{3})^2$
2. $\sqrt{3}(3-2\sqrt{3})^2$
3. $2\sqrt{3}(2-\sqrt{3})^2$
4. $\sqrt{3}(-2-2\sqrt{3})^2$
5. $2\sqrt{3}(2\sqrt{3}-2)^2$
6. $(\sqrt[3]{2\sqrt{2}}+2\sqrt{3})^2$
7. $\sqrt{2}(-2-\sqrt[3]{2\sqrt{2}})$
8. $(1-\sqrt{5})(2-2\sqrt{5})$
9. $(\sqrt[3]{2\sqrt{2}}-2\sqrt{3})^2$
10. $3\sqrt{3}(-3+3\sqrt{3})^2$
11. $\sqrt{2}(-3\sqrt{2}-\sqrt{3})^2$
12. $(2-\sqrt{2})(3-2\sqrt{2})$
13. $(2\sqrt{2}+2)(-1+\sqrt{2})$
14. $(-3-2\sqrt{3})(1+\sqrt{3})$
15. $(1+3\sqrt{6})(3\sqrt{6}+3)$
16. $(3\sqrt{3}+3)(3\sqrt{3}+2)$
17. $(1+2\sqrt{6})(3+2\sqrt{6})$
18. $(-2-\sqrt{5})(-3\sqrt{5}-2)$
19. $\sqrt{2}(-3\sqrt{3}+3\sqrt{2})^2$
20. $(-\sqrt{2}+2)(-3\sqrt{2}-3)$
21. $2\sqrt{2}(-\sqrt{2}+3\sqrt{3})^2$
22. $3\sqrt{3}(2\sqrt{3}+3\sqrt{2})^2$
23. $(-3+\sqrt{6})(-3+2\sqrt{6})$
24. $2\sqrt{3}(-3\sqrt{3}+2\sqrt{2})^2$
25. $(-2\sqrt{3}-3)(-3\sqrt{3}+3)^2$
26. $(3\sqrt{6}-\sqrt{2})(-\sqrt{2}+\sqrt{6})$
27. $3\sqrt{2}+3\sqrt{2}(-\sqrt{3}-\sqrt{2})^2$
28. $(3\sqrt{2}-\sqrt{5})(-2\sqrt{2}+\sqrt{5})$
29. $(\sqrt{3}+3\sqrt{6})(-3\sqrt{6}+\sqrt{3})$
30. $\sqrt{3}(2-\sqrt{3})+\sqrt{3}(3-2\sqrt{3})$
31. $(-2\sqrt{2}+2\sqrt{6})(-2\sqrt{6}-\sqrt{2})$
32. $3\sqrt{5}(3+\sqrt{5})+\sqrt{5}(-3-\sqrt{5})$
33. $(2\sqrt{2}+3\sqrt{3})(-\sqrt{2}+2\sqrt{3})^2$
34. $2\sqrt{3}(2-\sqrt{3})+\sqrt{3}(-3+3\sqrt{3})$
35. $\sqrt{6}(3+3\sqrt{6})+\sqrt{6}(-3+2\sqrt{6})$
36. $2\sqrt{2}(1-2\sqrt{2})+3\sqrt{2}(-\sqrt{2}-3)$

10. Realiza la operación:

1. $\frac{2\sqrt{2}}{3}\left(\frac{2}{3}+\sqrt{2}\right)^2$
2. $\frac{2\sqrt{2}}{3}\left(\frac{2\sqrt{2}}{2}-1\right)^2$
3. $\frac{\sqrt{2}}{3}\left(\frac{2\sqrt{3}}{3}-\sqrt{2}\right)^2$
4. $\frac{2\sqrt{3}}{3}\left(\frac{\sqrt{2}}{2}-3\sqrt{3}\right)^2$
5. $\frac{3\sqrt{3}}{2}\left(-\frac{2}{3}+\frac{\sqrt{3}}{2}\right)^2$
6. $\frac{3\sqrt{2}}{2}\left(-\frac{2\sqrt{3}}{3}-\sqrt{2}\right)^2$
7. $\left(1+\frac{\sqrt{6}}{3}\right)\left(3-\frac{3\sqrt{6}}{2}\right)$
8. $(3-3\sqrt{3})\left(\frac{1}{3}-\frac{\sqrt{3}}{6}\right)$
9. $(-\sqrt{5}-\frac{1}{3})\left(-3+\frac{\sqrt{5}}{2}\right)$
10. $\left(1-\frac{3\sqrt{5}}{2}\right)\left(\frac{\sqrt{5}}{6}-\frac{3}{2}\right)$
11. $\left(3-\frac{3\sqrt{5}}{2}\right)\left(\frac{2}{3}-\frac{\sqrt{5}}{2}\right)$
12. $\left(\frac{3\sqrt{3}}{2}+2\right)\left(-2-\frac{\sqrt{3}}{2}\right)$
13. $\left(\sqrt{6}+\frac{1}{2}\right)\left(-\frac{3}{2}+3\sqrt{6}\right)$
14. $\frac{\sqrt{2}}{2}+\frac{\sqrt{2}}{2}\left(-\frac{1}{2}-\sqrt{2}\right)^2$
15. $\left(-1+\frac{2\sqrt{3}}{3}\right)\left(3\sqrt{3}+\frac{1}{2}\right)$
16. $\frac{\sqrt{2}}{2}\left(-3-\frac{3\sqrt{2}}{2}\right)+\frac{\sqrt{2}}{3}(3+\sqrt{2})$
17. $\frac{3\sqrt{3}}{2}(3-\sqrt{3})+\frac{\sqrt{3}}{2}\left(-\frac{2}{3}-\frac{\sqrt{3}}{6}\right)$
18. $\frac{2\sqrt{2}}{3}\left(\frac{3\sqrt{2}}{2}-3\right)-\frac{3\sqrt{2}}{2}(2-2\sqrt{2})$

11. Racionaliza la fracción:

1. $\frac{5}{\sqrt{2}}$
2. $\frac{3}{\sqrt{3}}$
3. $\frac{\sqrt{2}}{\sqrt{5}}$
4. $\frac{5}{\sqrt[3]{3}}$
5. $\frac{3}{\sqrt[3]{3}}$
6. $\frac{3\sqrt{2}}{\sqrt{3}}$
7. $\frac{2\sqrt{5}}{\sqrt{6}}$
8. $\frac{2}{5\sqrt{6}}$
9. $\frac{5\sqrt{2}}{\sqrt{5}}$
10. $\frac{2\sqrt{3}}{3\sqrt{2}}$
11. $\frac{3\sqrt[3]{2}}{2\sqrt[3]{3}}$
12. $\frac{2}{5\sqrt[3]{2}}$
13. $\frac{3}{2\sqrt[3]{2}}$
14. $\frac{\sqrt{3}}{\sqrt{2}}$
15. $\frac{\sqrt[3]{2}}{\sqrt{3}}$
16. $\frac{\sqrt[3]{3}}{\sqrt{4}}$
17. $\frac{3}{\sqrt{6}+\sqrt{2}}$
18. $\frac{2}{\sqrt{2}-\sqrt{6}}$
19. $\frac{\sqrt{5}}{\sqrt{5}+\sqrt{2}}$
20. $\frac{\sqrt{5}+\sqrt{2}}{\sqrt{3}+\sqrt{2}}$
21. $\frac{2}{5\sqrt{2}-\sqrt{3}}$
22. $\frac{5\sqrt{2}}{2\sqrt{2}-\sqrt{3}}$
23. $\frac{2}{3\sqrt{3}-\sqrt{6}}$
24. $\frac{3\sqrt{6}-3}{\sqrt{2}-5\sqrt{3}}$
25. $\frac{3+\sqrt{6}}{\sqrt{6}-2\sqrt{2}}$
26. $\frac{2-\sqrt{6}}{\sqrt{3}-2\sqrt{5}}$
27. $\frac{3+5\sqrt{2}}{3\sqrt{6}-\sqrt{3}}$

12. Realiza la operación:

1. $\sqrt{2}\frac{2}{\sqrt[3]{4\sqrt{6}}}\sqrt[3]{\frac{3}{4}}$
2. $\frac{5}{3\sqrt[3]{5}}(\sqrt{5})^3\frac{5}{\sqrt[6]{5}}$
3. $\frac{3}{\sqrt[3]{3\sqrt{3}}}\sqrt[2]{6}\frac{3}{\sqrt[4]{3}}$
4. $-\frac{3}{\sqrt{3}}\sqrt[3]{3}\frac{3}{\sqrt{3}\sqrt{3}}$
5. $-\left(\frac{2}{\sqrt{2}}\right)^3\frac{3}{\sqrt[4]{3}}\sqrt[4]{54}$
6. $\sqrt{2}\left(\frac{5}{2\sqrt{5}}\right)^3\frac{5}{3\sqrt[4]{5}}$
7. $\frac{2}{3\sqrt[6]{2}}\sqrt[3]{4}\left(\frac{2}{\sqrt{2}}\right)^3$
8. $3\sqrt[6]{\frac{6}{2\sqrt{6}}}\cdot\frac{2}{3\sqrt{2}}$
9. $\frac{9}{\sqrt[6]{243}}\sqrt[3]{2}\left(-\frac{3}{\sqrt{3}}\right)^3$
10. $\frac{2}{\sqrt[12]{2}}\left(\frac{3}{2\sqrt{2}}\right)^3\sqrt[2]{2}$
11. $-\frac{2}{\sqrt[2]{2\sqrt{10}}}\sqrt[2]{\frac{2}{5}}\sqrt{2}$
12. $\sqrt[3]{\frac{3}{2\sqrt{2}\sqrt{6}}}\left(\frac{2}{\sqrt{2}}\right)^3$

$$\begin{array}{llll}
13. \left(\sqrt{\frac{5}{2}}\right)^3 2\sqrt{\frac{2}{5}} \cdot 2\sqrt{2} & 14. \frac{2}{\sqrt[4]{2}} \cdot \frac{7}{2\sqrt[4]{7}} 3\sqrt[3]{7\sqrt{7}} & 15. \frac{2}{3\sqrt[4]{6}} \left(\frac{2}{\sqrt{2}}\right)^3 (-3\sqrt{6}) & 16. \frac{3}{\sqrt[3]{9\sqrt{3}}} (2\sqrt{3})^3 \frac{3}{\sqrt[3]{9}} \\
17. \left(\sqrt{\frac{2}{5}}\right)^3 2\sqrt{\frac{4}{5}} (-4\sqrt{5}) & 18. -\frac{2}{\sqrt{2}} \cdot \frac{2}{3\sqrt{2\sqrt{2}}} (-\sqrt{2}) & 19. \frac{2}{3\sqrt{2\sqrt{2}}} \sqrt{5} \left(-\sqrt{\frac{5}{2}}\right)^3 & 20. 2\sqrt{2} \frac{2}{\sqrt{5\sqrt{10}}} \sqrt{\frac{2}{125}} \\
21. -\frac{2}{3\sqrt[3]{3}} 3\sqrt[4]{27} \left(-\frac{5}{\sqrt{5}}\right)^3 & 22. -\frac{5}{\sqrt[6]{5}} \left(-\sqrt[3]{\frac{5}{2}}\right) (-2\sqrt{5})^3 & 23. \frac{5}{\sqrt[3]{5\sqrt{5}}} \left(-\frac{5}{2\sqrt[3]{5}}\right) 2\sqrt[6]{5} & 24. 2\sqrt[3]{4\sqrt{2}} \left(-3\sqrt[3]{\frac{2}{3}}\right) \frac{2}{\sqrt{2}} \\
25. -\left(\frac{3}{\sqrt{3}}\right)^3 \frac{3}{2\sqrt{2\sqrt{2}}} 2\sqrt[4]{8} & 26. \left(\sqrt{\frac{3}{2}}\right)^3 2\sqrt{2} \left(-\frac{3}{\sqrt{3\sqrt{3}}}\right) & 27. 2\sqrt[3]{100} \left(\frac{5}{2\sqrt{10}}\right)^3 \sqrt[6]{\frac{2}{5}} & 28. \frac{3}{\sqrt{3\sqrt{3}}} \left(\sqrt{\frac{2}{3}}\right)^3 (-3\sqrt{3}) \\
29. \sqrt{3\sqrt{3}} \left(\frac{2}{\sqrt{2}}\right)^3 \left(-3\sqrt{\frac{4}{3}}\right) & 30. -(2\sqrt{2})^3 \left(-\sqrt{\frac{4}{2}}\right) \left(-\frac{2}{\sqrt[4]{2}}\right) & 31. \frac{7}{2\sqrt[4]{7}} 3\sqrt[3]{3\sqrt{3}} \left(-3\sqrt{\frac{3}{7}}\right) & 32. 2\sqrt[4]{2} \frac{5}{2\sqrt[3]{5\sqrt{5}}} \left(-\frac{5}{2\sqrt{5}}\right)^3
\end{array}$$

13. Realiza la operación:

$$\begin{array}{lll}
1. \frac{2}{3\sqrt{2}} \left(1 + \frac{3}{\sqrt{2}}\right)^2 & 2. \frac{2\sqrt{3}}{3+\sqrt{3}} \left(3 + \frac{2}{\sqrt{3}}\right)^2 & 3. \frac{\sqrt{2}}{3+\sqrt{2}} \left(3 + \frac{2}{\sqrt{2}}\right)^2 \\
4. \frac{2}{\sqrt{3}} \left(\frac{3}{\sqrt{3}} - \frac{2}{\sqrt{2}}\right)^2 & 5. \frac{2}{\sqrt{3}} \left(\sqrt{\frac{1}{3}} + \sqrt{2}\right)^2 & 6. \frac{2}{\sqrt{2}} \left(2\sqrt{\frac{1}{2}} + 3\right)^2 \\
7. \frac{2\sqrt{2}}{1+\sqrt{2}} \left(3 - 3\sqrt{\frac{1}{2}}\right)^2 & 8. \frac{3}{2\sqrt{2}} \left(-3 + \frac{3\sqrt{2}}{2-\sqrt{2}}\right)^2 & 9. \frac{3}{2\sqrt{3}} \left(\sqrt{\frac{1}{3}} - 2\sqrt{2}\right)^2 \\
10. 2\sqrt{3} \left(\frac{2}{\sqrt{3}} - \frac{3}{3+\sqrt{3}}\right)^2 & 11. 2\sqrt{3} \left(\sqrt{\frac{1}{2}} + 3\sqrt{\frac{1}{3}}\right)^2 & 12. \frac{2}{3\sqrt{3}} \left(2\sqrt{\frac{1}{3}} + \frac{3}{\sqrt{2}}\right)^2 \\
13. \frac{3}{2\sqrt{2}} \left(2\sqrt{\frac{1}{3}} + 3\sqrt{2}\right)^2 & 14. \frac{3}{2\sqrt{3}} - \frac{3}{2\sqrt{3}} (-1 - 2\sqrt{3})^2 & 15. \left(\frac{3}{2+\sqrt{2}} - \frac{3}{2\sqrt{2}}\right) (\sqrt{2} - 2) \\
16. \left(\frac{\sqrt{3}}{\sqrt{3}-3} - \frac{1}{\sqrt{3}-1}\right) (-\sqrt{3}-3) & 17. \left(\frac{3\sqrt{2}}{1-\sqrt{2}} + \frac{2}{2+\sqrt{2}}\right) (-\sqrt{2}-2) & 18. \left(\frac{3}{3+\sqrt{6}} + \frac{\sqrt{6}}{1+\sqrt{6}}\right) (2\sqrt{6}+1) \\
19. \left(-\frac{\sqrt{5}}{3-\sqrt{5}} - \frac{3}{\sqrt{5}+1}\right) (-\sqrt{5}+3) & 20. \left(3\sqrt{\frac{1}{2}} - \frac{2}{3-\sqrt{2}}\right) (-1-2\sqrt{2}) & 21. \left(\frac{2\sqrt{6}}{1+\sqrt{6}} - \frac{3}{\sqrt{6}+2}\right) (-1-2\sqrt{6}) \\
22. \left(-3\sqrt{\frac{1}{2}} - \frac{3}{2\sqrt{3}}\right) (2\sqrt{3}+\sqrt{2}) & 23. 2\sqrt{3} + \frac{2}{3\sqrt{2}} \left(2\sqrt{3} - 3\sqrt{\frac{1}{2}}\right)^2 & 24. \frac{2}{\sqrt{2}} (2-\sqrt{2}) - \frac{3}{2\sqrt{2}} (2-3\sqrt{2}) \\
25. \left(\sqrt{\frac{1}{5}} - 2\sqrt{\frac{2}{3}}\right) (2\sqrt{6}-2\sqrt{5}) & 26. \frac{3}{2\sqrt{5}} (\sqrt{5}+3) - \frac{2}{3\sqrt{5}} (2+3\sqrt{5}) & 27. \frac{3}{2\sqrt{5}} (\sqrt{5}-3) - \frac{3}{2\sqrt{5}} (-2-2\sqrt{5}) \\
28. 3\sqrt{5} \left(-2 + \frac{6}{\sqrt{5}}\right) + \frac{3}{\sqrt{5}} (-2-3\sqrt{5}) & 29. \left(-2\sqrt{\frac{1}{3}} - \frac{2}{3\sqrt{6}}\right) (-3\sqrt{6}+2\sqrt{3}) & 30. \frac{2\sqrt{6}}{3-\sqrt{6}} \left(\sqrt{\frac{3}{2}} - 3\right) - \frac{2}{\sqrt{6}} (-1-3\sqrt{6})
\end{array}$$

- 1.1. $6\sqrt{21}$ 1.2. $10\sqrt{6}$ 1.3. $5\sqrt{30}$ 1.4. $3\sqrt[3]{36}$ 1.5. $2\sqrt[4]{42}$ 1.6. $11\sqrt{11}$ 1.7. $15\sqrt{6}$ 1.8. $7\sqrt[3]{5}$ 1.9. $5\sqrt[4]{2}$ 1.10. $14\sqrt{5}$ 1.11. $12\sqrt{42}$ 1.12. $7\sqrt[3]{4}$ 1.13. $18\sqrt{15}$
 1.14. $5\sqrt[4]{3}$ 1.15. $9\sqrt[3]{3}$ 1.16. $8\sqrt[3]{10}$ 1.17. $9\sqrt[3]{15}$ 1.18. $27\sqrt{14}$ 1.19. $33\sqrt{11}$ 1.20. $26\sqrt{6}$ 1.21. $21\sqrt{30}$ 1.22. $36\sqrt{10}$ 1.23. $2ab^3\sqrt[3]{3a}$ 1.24. $3a^3b^3\sqrt[3]{3a}$
 1.25. $3a^2b^2\sqrt{10a}$ 1.26. $6a^2b\sqrt{5ab}$ 1.27. $2a^2b^3\sqrt{14b}$ 1.28. $3a^2b^3\sqrt{5ab}$ 1.29. $7a^2b^5\sqrt{2ab}$ 1.30. $3a^2b^5\sqrt{6b}$ 1.31. $7a^4b^6\sqrt{2}$ 1.32. $6a^3b^3\sqrt[3]{3}$ 1.33. $9ab^5\sqrt[3]{3a}$
 1.34. $6ab^4\sqrt[3]{2a^2}$ 1.35. $4ab^2\sqrt[3]{7a^2b}$ 1.36. $3a^7b^2\sqrt[3]{3ab}$ 1.37. $6a^2b^3\sqrt{14b}$ 1.38. $6ab\sqrt[3]{14a^2b^2}$ 1.39. $4a^3b^3\sqrt{14}$ 1.40. $4a^4b^3\sqrt[4]{6a^2}$ 1.41. $2a^2b^6\sqrt[4]{6a^3b}$ 1.42.
 $4a^2b^5\sqrt[3]{9ab}$ 1.43. $6ab^2\sqrt{3a}$ 1.44. $2a^4b^5\sqrt{5}$ 1.45. $6a^3b^3\sqrt{3b}$ 1.46. $2a^5b^2\sqrt[4]{10ab^3}$ 1.47. $4a^5b^2\sqrt[3]{21}$ 1.48. $4a^3b^2\sqrt{3a}$ 2.1. $2a\sqrt{a-1}$ 2.2. $2a\sqrt{a-2}$ 2.3. $6a^2\sqrt{1-a}$
 2.4. $9a\sqrt{3a-3}$ 2.5. $9a^2\sqrt{2a-2}$ 2.6. $4a^2-4a$ 2.7. $6a^3-6a^2$ 2.8. $6ab^7\sqrt{4-2a}$ 2.9. $6a^2b^5\sqrt{2ab-2b}$ 2.10. $2a^2b^3\sqrt{2ab+4b}$ 2.11. $6ab^4\sqrt{3ab+3b}$ 2.12. $9a^2(a-1)\sqrt{3}$
 2.13. $12a^2b^5\sqrt{a+1}$ 2.14. $(2a^3b^2+4a^2b^2)\sqrt{b}$ 2.15. $2a^2b^6+ab^6$ 3.1. $-30\sqrt[4]{8}$ 3.2. -18 3.3. $54\sqrt[3]{6}$ 3.4. $20\sqrt[6]{20}$ 3.5. $30\sqrt[4]{75}$ 3.6. $30\sqrt[3]{4}$ 3.7. $-27\sqrt[6]{24}$ 3.8.
 $-90\sqrt[4]{40}$ 3.9. $-135\sqrt[4]{8}$ 3.10. $60\sqrt[4]{50}$ 3.11. $-18\sqrt[3]{10}$ 3.12. $120\sqrt[6]{80}$ 3.13. $-48\sqrt[3]{3}$ 3.14. $12a^4\sqrt[4]{4a^3}$ 3.15. $27a^6\sqrt[3]{3a}$ 3.16. $-a^5\sqrt[4]{9a^3}$ 3.17. $-9a^5\sqrt[4]{125a^3}$ 3.18.
 $-8a^4\sqrt[6]{125a^4}$ 3.19. $-4a^5\sqrt[6]{32a^3}$ 3.20. $-a^4b^5\sqrt[4]{ab^3}$ 4.1. $5\sqrt[4]{125}$ 4.2. $3\sqrt[3]{3}$ 4.3. $3\sqrt{3}$ 4.4. $\sqrt{3}$ 4.5. 64 4.6. $3\sqrt{3}$ 4.7. $\sqrt[3]{10}$ 4.8. $216\sqrt[3]{6}$ 4.9. $45\sqrt[3]{5}$ 4.10.
 $a^6\sqrt[3]{a^2}$ 4.11. $a^7\sqrt{a}$ 4.12. a^{10} 4.13. $45a^3$ 4.14. $9a^{10}$ 4.15. $8a^5\sqrt{a}$ 4.16. $2a^4\sqrt[3]{2a^2}$ 4.17. $-a^5\sqrt{5a}$ 4.18. $27a^5\sqrt{5a}$ 4.19. $72a^5\sqrt[4]{3a}$ 4.20. $a^{10}b^8$ 4.21.
 $16a^5b^4\sqrt[3]{a}$ 5.1. $\sqrt{6}$ 5.2. $\sqrt[3]{5}$ 5.3. $\sqrt{2}$ 5.4. $\sqrt{2}$ 5.5. $\sqrt[3]{5}$ 5.6. $\sqrt[3]{3}$ 5.7. $\sqrt[4]{27}$ 5.8. $\sqrt[3]{10}$ 5.9. $\sqrt[4]{40}$ 5.10. $\sqrt[3]{30}$ 5.11. $\sqrt[10]{128}$ 5.12. $\sqrt[3]{45}$ 5.13. $\sqrt[6]{75}$ 5.14.
 $\sqrt[5]{12}$ 5.15. $\sqrt[5]{80}$ 5.16. $\sqrt[4]{12}$ 5.17. $\sqrt[3]{25}$ 5.18. $\sqrt{30}$ 5.19. $\sqrt[3]{4a}$ 5.20. $\sqrt{3a}$ 5.21. $\sqrt[4]{4a}$ 5.22. $\sqrt[5]{4a^2}$ 5.23. $\sqrt[4]{9a}$ 5.24. $\sqrt[5]{12a^3}$ 5.25. $\sqrt{3a}$ 5.26. $\sqrt[3]{20a^2}$
 5.27. $\sqrt[5]{16a^2}$ 5.28. $\sqrt[6]{16a^5}$ 5.29. $\sqrt{6a}$ 5.30. $\sqrt{10a}$ 5.31. $\sqrt[3]{5a^2b}$ 5.32. $\sqrt[5]{3ab^2}$ 5.33. $\sqrt[5]{8a^4b}$ 5.34. $\sqrt[6]{5a^2b^5}$ 5.35. $\sqrt[10]{5ab^4}$ 6.1. $54\sqrt[4]{72}$ 6.2. $27\sqrt[6]{32}$ 6.3.
 $24\sqrt[3]{3}$ 6.4. $16\sqrt[4]{54}$ 6.5. $-4\sqrt[4]{108}$ 6.6. 12 6.7. $10\sqrt[4]{20}$ 6.8. $-36\sqrt[4]{12}$ 6.9. $-18\sqrt[4]{12}$ 6.10. $-18\sqrt[4]{8}$ 6.11. $-12\sqrt[3]{4}$ 6.12. $4\sqrt{10}$ 6.13. $-384\sqrt[3]{243}$ 6.14. $-150\sqrt[4]{125}$
 6.15. $-40\sqrt{5}$ 6.16. $-54\sqrt[4]{24}$ 6.17. $75\sqrt[4]{5}$ 6.18. $90\sqrt{5}$ 6.19. $24\sqrt[4]{5}$ 6.20. $54\sqrt{2}$ 6.21. $-48\sqrt[3]{3}$ 6.22. $-48\sqrt[3]{3}$ 6.23. $-9a^5\sqrt{3a}$ 6.24. $-a^8\sqrt[4]{25a}$ 6.25. $2a^6\sqrt[4]{27a}$
 6.26. $-2a^{10}\sqrt{2a}$ 6.27. $-24a^{12}\sqrt[4]{27}$ 6.28. $8a^5$ 7.1. $\frac{\sqrt[3]{3}}{6}$ 7.2. $\frac{-3\sqrt[4]{2}}{25}$ 7.3. $\frac{\sqrt[3]{5}}{5}$ 7.4. $\frac{-9\sqrt[4]{24}}{2}$ 7.5. $\frac{4\sqrt[4]{72}}{3}$ 7.6. $\frac{-4}{9}$ 7.7. $\frac{-2\sqrt[4]{135}}{5}$ 7.8. $2\sqrt[4]{40}$ 7.9. $\frac{-\sqrt[4]{75}}{2}$ 7.10.
 $-27\sqrt[3]{3}$ 7.11. $\frac{-3\sqrt[4]{24}}{2}$ 7.12. $\frac{108\sqrt[4]{75}}{25}$ 7.13. $\frac{-3\sqrt[4]{4}}{2}$ 7.14. $-3\sqrt[4]{10}$ 7.15. $\frac{-2\sqrt[6]{96}}{27}$ 7.16. $\frac{6\sqrt[6]{5}}{5}$ 7.17. $\frac{-18\sqrt[6]{5}}{5}$ 7.18. $\frac{-\sqrt[6]{48}}{8}$ 7.19. $\frac{3\sqrt{6}}{4}$ 7.20. $\frac{-27\sqrt[6]{72}}{2}$ 7.21.
 $\frac{48\sqrt[4]{125}}{25}$ 7.22. $\frac{10\sqrt[3]{15}}{9}$ 7.23. $\frac{2\sqrt[3]{36}}{3}$ 7.24. $\frac{-2\sqrt{15}}{75}$ 7.25. $\frac{-9a^4\sqrt[4]{a^3}}{2}$ 7.26. $\frac{2a^5\sqrt[4]{125}}{15}$ 7.27. $\frac{a^5\sqrt[6]{9a}}{3}$ 7.28. $\frac{9a^8\sqrt[3]{5}}{40}$ 8.1. $-6-33\sqrt{5}$ 8.2. $4-25\sqrt{5}$ 8.3.
 $3+3\sqrt{2}-22\sqrt{3}$ 8.4. $7\sqrt{6+1+\sqrt{2}}$ 8.5. $4-24\sqrt{5-10\sqrt{3}}$ 8.6. $10\sqrt{6+3+6\sqrt{5}}$ 8.7. $18\sqrt{2-4\sqrt{3}}$ 8.8. $10\sqrt{6+\sqrt{2}-1}$ 8.9. $16\sqrt{3-3-15\sqrt{6}}$ 8.10. $14\sqrt{5}$ 8.11.
 $11\sqrt{5-4\sqrt{3}-22\sqrt{6}}$ 8.12. $4\sqrt{3-35\sqrt{2+9\sqrt{5}}}$ 8.13. $-24\sqrt{2-16\sqrt{5}}$ 8.14. $10\sqrt{6-15\sqrt{3}}$ 8.15. $4\sqrt{3-4\sqrt{2-10\sqrt{5}}}$ 8.16. $12\sqrt{2-17\sqrt{3-15\sqrt{6}}}$ 8.17. $57\sqrt{3-3\sqrt{2}-2\sqrt{6}}$ 8.18.
 $25\sqrt{5+7\sqrt{6}-6\sqrt{3}}$ 8.19. $11\sqrt{5-4\sqrt{6}}$ 8.20. $4\sqrt{2-12\sqrt{6}}$ 8.21. $-28\sqrt{3-25\sqrt{5}-5\sqrt{6}}$ 8.22. $-2a+16a\sqrt{5a}$ 8.23. $22a\sqrt{3-3\sqrt{5a}-4}$ 8.24. $32a\sqrt{2a+12a\sqrt{5}-1}$ 8.25.
 $2a+14a\sqrt{5}$ 8.26. $-20a\sqrt{2}$ 8.27. $-3a-14a\sqrt{3-3a\sqrt{5a}}$ 9.1. $12+13\sqrt{3}$ 9.2. $21\sqrt{3-36}$ 9.3. $14\sqrt{3-24}$ 9.4. $24+16\sqrt{3}$ 9.5. $32\sqrt{3-48}$ 9.6. $14+4\sqrt{6}$ 9.7.
 $26-\sqrt{2-2-2\sqrt{2}}$ 9.8. $12-4\sqrt{5}$ 9.9. $30-12\sqrt{6}$ 9.10. $108\sqrt{3-162}$ 9.11. $21\sqrt{2+12\sqrt{3}}$ 9.12. $10-7\sqrt{2}$ 9.13. 2 9.14. $-9-5\sqrt{3}$ 9.15. $57+12\sqrt{6}$ 9.16. $33+15\sqrt{3}$
 9.17. $27+8\sqrt{6}$ 9.18. $19+8\sqrt{5}$ 9.19. $45\sqrt{2-36\sqrt{3}}$ 9.20. $-3\sqrt{2}$ 9.21. $58\sqrt{2-24\sqrt{3}}$ 9.22. $90\sqrt{3+108\sqrt{2}}$ 9.23. $21-9\sqrt{6}$ 9.24. $70\sqrt{3-72\sqrt{2}}$ 9.25. $-18\sqrt{3}$ 9.26.
 $20-8\sqrt{3}$ 9.27. $18\sqrt{2+12\sqrt{3}}$ 9.28. $5\sqrt{10-17}$ 9.29. -51 9.30. $5\sqrt{3-9}$ 9.31. $4\sqrt{3-20}$ 9.32. $10+6\sqrt{5}$ 9.33. $40-6\sqrt{2}$ 9.34. $3+\sqrt{3}$ 9.35. 30 9.36. $-14-7\sqrt{2}$
 10.1. $\frac{44\sqrt{2+48}}{27}$ 10.2. $\frac{34\sqrt{2-48}}{27}$ 10.3. $\frac{10\sqrt{2-8\sqrt{3}}}{9}$ 10.4. $\frac{55\sqrt{3-18\sqrt{2}}}{3}$ 10.5. $\frac{43\sqrt{3-72}}{24}$ 10.6. $5\sqrt{2+4\sqrt{3}}$ 10.7. $\frac{-\sqrt{6}}{2}$ 10.8. $\frac{5-3\sqrt{3}}{2}$ 10.9. $\frac{17\sqrt{5-9}}{6}$ 10.10.
 $\frac{29\sqrt{5-33}}{12}$ 10.11. $\frac{23-10\sqrt{5}}{4}$ 10.12. $\frac{-25-16\sqrt{3}}{4}$ 10.13. $\frac{69}{4}$ 10.14. $\frac{8+13\sqrt{2}}{8}$ 10.15. $\frac{33-16\sqrt{3}}{6}$ 10.16. $\frac{-5-3\sqrt{2}}{6}$ 10.17. $\frac{50\sqrt{3-57}}{12}$ 10.18. $8-5\sqrt{2}$ 11.1. $\frac{5\sqrt{2}}{2}$
 11.2. $\sqrt{3}$ 11.3. $\frac{\sqrt{10}}{5}$ 11.4. $\frac{5\sqrt[3]{9}}{3}$ 11.5. $\sqrt[3]{9}$ 11.6. $\sqrt{6}$ 11.7. $\frac{\sqrt{30}}{3}$ 11.8. $\frac{\sqrt{6}}{15}$ 11.9. $\sqrt{10}$ 11.10. $\frac{\sqrt{6}}{3}$ 11.11. $\frac{\sqrt[3]{18}}{2}$ 11.12. $\frac{\sqrt[3]{4}}{5}$ 11.13. $\frac{3\sqrt[3]{4}}{4}$ 11.14. $\frac{\sqrt{6}}{2}$
 11.15. $\frac{\sqrt[3]{18}}{3}$ 11.16. $\frac{\sqrt[3]{6}}{2}$ 11.17. $\frac{3\sqrt{6}-3\sqrt{2}}{4}$ 11.18. $\frac{-\sqrt{2}-\sqrt{6}}{2}$ 11.19. $\frac{5-\sqrt{10}}{3}$ 11.20. $\sqrt{6-\sqrt{10}+\sqrt{15}-2}$ 11.21. $\frac{10\sqrt{2+2\sqrt{3}}}{47}$ 11.22. $4+\sqrt{6}$ 11.23. $\frac{6\sqrt{3+2\sqrt{6}}}{21}$
 11.24. $\frac{9\sqrt{3-42\sqrt{2}}}{73}$ 11.25. $\frac{-3\sqrt{6}-6\sqrt{2}-6-4\sqrt{3}}{2}$ 11.26. $\frac{2\sqrt{30+3\sqrt{2}-2\sqrt{3}-4\sqrt{5}}}{17}$ 11.27. $\frac{14\sqrt{6+33\sqrt{3}}}{51}$ 12.1. $\sqrt[6]{3}$ 12.2. $\frac{125}{3}$ 12.3. $6\sqrt[4]{108}$ 12.4. $-9\sqrt[4]{3}$ 12.5.
 $-6\sqrt[4]{72}$ 12.6. $\frac{25\sqrt[4]{20}}{24}$ 12.7. $\frac{16}{3}$ 12.8. $6\sqrt[4]{6}$ 12.9. $-9\sqrt[3]{18}$ 12.10. $\frac{27\sqrt[3]{4}}{8}$ 12.11. $\frac{-4\sqrt[4]{10}}{5}$ 12.12. $\frac{3\sqrt[4]{24}}{2}$ 12.13. $10\sqrt[4]{10}$ 12.14. $-6\sqrt[4]{72}$ 12.15. $-4\sqrt[4]{24}$ 12.16.
 72 12.17. $\frac{-8\sqrt[4]{50}}{25}$ 12.18. $\frac{2\sqrt[4]{2}}{3}$ 12.19. $\frac{-25\sqrt[4]{8}}{12}$ 12.20. $\frac{4\sqrt{10}}{25}$ 12.21. $10\sqrt[4]{75}$ 12.22. $-100\sqrt[3]{100}$ 12.23. $-5\sqrt[3]{5}$ 12.24. $-4\sqrt[3]{36}$ 12.25. $-9\sqrt{3}$ 12.26. $-3\sqrt[4]{27}$
 12.27. $\frac{25\sqrt[3]{2}}{8}$ 12.28. $-2\sqrt[4]{12}$ 12.29. $-18\sqrt[4]{2}$ 12.30. $-32\sqrt[4]{7}$ 12.31. $\frac{-27\sqrt[4]{7}}{2}$ 12.32. $\frac{-25\sqrt[4]{2}}{8}$ 13.1. $\frac{12+11\sqrt{2}}{6}$ 13.2. $\frac{5+19\sqrt{3}}{3}$ 13.3. $2+3\sqrt{2}$ 13.4. $5\sqrt{3}-6\sqrt{2}$
 13.5. $\frac{20\sqrt{3+24\sqrt{2}}}{9}$ 13.6. $12+11\sqrt{2}$ 13.7. $90-63\sqrt{2}$ 13.8. $\frac{27\sqrt{2}}{2}$ 13.9. $\frac{25\sqrt{3}-12\sqrt{2}}{6}$ 13.10. $\frac{38\sqrt{3}-63}{3}$ 13.11. $7\sqrt{3}+6\sqrt{2}$ 13.12. $\frac{35\sqrt{3+36\sqrt{2}}}{27}$ 13.13.
 $\frac{29\sqrt{2+12\sqrt{3}}}{9}$ 13.14. $-6-6\sqrt{3}$ 13.15. $\frac{15\sqrt{2-21}}{2}$ 13.16. $6+4\sqrt{3}$ 13.17. $16+12\sqrt{2}$ 13.18. $\frac{36\sqrt{6}-51}{5}$ 13.19. $6-4\sqrt{5}$ 13.20. $\frac{-8+\sqrt{2}}{2}$ 13.21. $\frac{174-89\sqrt{6}}{10}$ 13.22.
 $\frac{-12-7\sqrt{6}}{2}$ 13.23. $\frac{11\sqrt{2-4\sqrt{3}}}{2}$ 13.24. $\frac{5+\sqrt{2}}{2}$ 13.25. $\frac{-150+26\sqrt{30}}{15}$ 13.26. $\frac{19\sqrt{5}-15}{30}$ 13.27. $\frac{45-3\sqrt{5}}{10}$ 13.28. $\frac{45-36\sqrt{5}}{5}$ 13.29. $\frac{16\sqrt{2}-6}{3}$ 13.30. $\frac{-11\sqrt{6}}{3}$