Montessori Math Workshop Problems

December 12, 2025

Solve, simplify as much as possible:

1. $\sqrt{150x^4y^{-8}} =$

2. $\sqrt{2(x-y)^5} =$

3. $\sqrt[5]{64x^{10}y^3} =$

4. $4\sqrt{27} - \sqrt{75} =$

5. $5\sqrt[3]{2} + \sqrt[3]{54}$

6. $\sqrt{72}\sqrt[3]{2} =$

7. $\sqrt{\sqrt{243}} =$

8. $\dfrac{\sqrt{x}}{\sqrt[4]{x}} =$

9. $x^3 \cdot \frac{1}{x^2} =$

10. $\left(\frac{y^2}{y^3}\right)^{-2} =$

11. $\left(\frac{16x^3y}{-4xy^3}\right) \cdot \left(\frac{2xy}{-x^{-1}}\right) =$

12. $\left(\frac{5x^{-3}y^2}{x^5y^{-1}}\right) \cdot \left(\frac{(2xy^3)^{-2}}{xy}\right) =$

13. $\frac{(r^3)^4}{(r^3)^8} =$

14. $\frac{x^4}{x^5} =$

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

Rationalize the denominator:

16. $\frac{1}{\sqrt{2}} =$

17. $\frac{3}{2+\sqrt{3}} =$

18. $\frac{4}{\sqrt{5}-3} =$

Rewrite as a decimal number:

19. $6.43 \times 10^4 =$

20. $3.072 \times 10^6 =$

21. $4.2 \times 10^{-2} =$

22. $1.52 \times 10^{-3} =$

23. $2.834 \times 10^2 =$

24. $4.9 \times 10^5 =$

25. $7.8 \times 10^{-1} =$

26. $1.23 \times 10^{-6} =$

Factor:

27. $x^2 + 3x - 18 =$

28. $x^2 + 5x - 36 =$

29. $x^2 - 121 =$

30. $x^2 - 14x + 49 =$

31. $3x^2 = 21x + 36 =$

32. $c^2 + 19c + 34 =$

33. $10x^2 + 11x + 3$

34. $4x^2 - 25 =$

35. $6b^2 - 42b + 36 =$