

Roots and Exponents

Dr. David M. Goulet

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In each problem, simplify the expression.

1. $\sqrt{x^2}$, where $x < 0$.

2. $\frac{y^2}{y^3}$

3. $\frac{5z^{12}}{120z^{-2}}$

4. $x^2x^{-4} + x^{-1}$

5. $\sqrt{12x^2y^5}$

6. $\sqrt[3]{27x^7}$

7. $(7^8 \times 7^9)^{10}$

8. $(x^3)^2$

9. $(x^2y^{-1})^{-2}$

10. $\left(\frac{2\sqrt{x^4y}}{6x^{-1}}\right)^5$

11. $\sqrt[5]{32}$

12. $\frac{\sqrt[4]{64x^2}}{\sqrt{8x^2}}$

13. $\sqrt{(x+1)^2(x^2+2)^3}$