

Simplifying and Solving Using Laws of Exponents

1. Evaluate. Show your work ... not just answers.

A) 4^{-2} B) $\left(\frac{2}{5}\right)^{-3}$ C) 32^{-2} D) $\left(\frac{1}{8}\right)^{-3}$

2. Evaluate. Show your work.

A) $(-2)^0 + \left(\frac{1}{7}\right)^{-2}$ B) $4^{-2} - 8^0 + 4^{-1}$ C) $\left(\frac{4}{5}\right)^{-1} - 2^{-2}$

3. Evaluate without the use of a calculator.

A) 3^{-2} B) 5^0 C) $(-2)^0$ D) $\left(\frac{1}{4}\right)^{-1}$

E) $\left(\frac{2}{5}\right)^{-2}$ F) -3^0 G) $\left(-\frac{5}{7}\right)^0$ H) $\frac{1}{4^{-2}}$

I) $(-6)^{-2}$ J) -6^{-2}

4. Simplify.

A) $(y^{-2} + x^{-1})^{-2}$ B) $(2y^2 + 3x^{-1})^{-1}$ C) $\left((3^{-1}y^{-2} + 4x^{-2})^{-3}\right)^0$ D) $(3^{-2} + 2^{-2}) \div (3^{-1} - 2^{-1})$

5. Simplify each expression, leaving only positive exponents in your answer.

A) $(2x^{\frac{1}{2}})(2x^{\frac{1}{2}})$ B) $(4x^{\frac{3}{2}}) \div (2x^{\frac{1}{2}})$ C) $(a^0)^{10}$ D) $(a^{\frac{2}{3}})^{\frac{3}{2}}$ E) $[(3^n)(3^{n+2})][(3^{2-n})(2^{n-4})]$

6. Solve for x:

A) $4^{5x+1} = 4^{11}$ B) $9^x = 3$ C) $4^{9x-2} = 256$ D) $23^{4x-12} = \frac{1}{23^{2x}}$

E) $25^{3x-1} = 5^{4-7x}$ F) $5^{8x+17} = \frac{1}{125}$ G) $\frac{1}{81^{2x}} = 9^{13-5x}$ H) $4^{5-9x} = \frac{1}{8^{x-2}}$

I) $8(2^x) = 128$ J) $4^{2x-3} - 9 = 55$ K) $9^{2x+1} = 81(27^x)$ L) $\left(\frac{4}{9}\right)^{x+1} = \left(\frac{27}{8}\right)^{x+6}$

7. Solve for x:

A) $4^x - 6(2^x) + 8 = 0$ B) $4^x - (2^x) - 2 = 0$ C) $9^x - 12(3^x) + 27 = 0$

D) $25^x - 23(5^x) - 50 = 0$ E) $49^x + 1 = 2(7^x)$