

Simplify.

- 1) -13^2 2) 12^{-2} 3) 0^0 4) $(-11)^{-2}$ 5) $(-1)^{40}$
- 6) $(-1)^{-99}$ 7) $(-8)^0$ 8) $\left(-\frac{4}{5}\right)^{-3}$ 9) $\left(-3\frac{2}{6}\right)^{-2}$ 10) $(-4)^{-2} + (-2)^{-2}$
- 11) $8^{-5} \cdot 8^7$ 12) $\frac{10^{-2}}{10^3}$ 13) $\frac{3^{-4}}{3^{-4}}$ 14) $2^3 \cdot 6^{-2}$ 15) $\frac{(-9)^{-8}}{(-9)^{-10}}$
- 16) $\frac{5^{-4} \cdot 5^{20}}{5^{20} \cdot 5^{-6}}$ 17) $\frac{6^{-6} \div 6^{-8}}{6^{-5} \div 6^{-9}}$ 18) $(-2^{-3})^{-4}$ 19) $\left[\left(-\frac{3}{5}\right)^6\right]^{-5}$
- 20) $(0^{-6})^8$ 21) $(9 \cdot 8)^{-7}$ 22) $[(-13)(-28)]^{-8}$ 23) $\frac{\left(\frac{12}{13}\right)^{-8}}{\left(\frac{12}{13}\right)^{-10}}$

For problems 24 through 26, convert to standard notation.

- 24) 10^{-4} 25) 3.45×10^4 26) 4.8×10^{-5}

Convert to standard notation and then simplify. Write the final answer in standard notation.

27) $0.65 \times 10^3 - 2050 \times 10^{-4} + 10.5 \times 10^0$

For problems 28 through 33, convert the numbers to scientific notation.

- 28) 0.00315×10^{-3} 29) 0.000001 30) 10^{-6}
- 31) $\frac{7}{8}$ 32) $\sqrt{225}$ 33) -16×8^{-2}

Simplify. Write the final answer in scientific notation.

34) $(500 \times 10^{-5})(0.0008 \times 10^2)$ 35) $\frac{271.8015 \times 10^5}{-0.03 \times 10^8}$

36) How many people speak Mandarin? Express your answer in scientific notation.

For problems 37 through 45, translate and then simplify.

37) The sum of the negative second power of the fraction three-fifths and the negative third power of the square root of four and the zero power of the fraction five-fourths.

38) The quotient of two products: the first product consists of the negative fourth power of nine and the ninth power of nine; the second product consists of the negative fifth power of nine and the twelfth power of nine.

39) The number positive ten raised to the power which is the sum of the fourth power of zero and the zero power of four.

40) The negative second power of the product of negative twenty and three-fifths.

41) Negative eleven raised to the power that is the sum of the third power of five and the third power of negative five.

42) The quotient of eleven raised to the negative eighth power with eleven raised to the negative thirteenth power.

43) Negative eight and two tenths times ten to the second power added to sixty-seven and forty-five hundredths times ten raised to the negative third power.

44) What is the distance (in light-years) across the Milky Way galaxy? Express the answer in scientific notation.

Review. Simplify the following complex fractions.

$$45) \frac{\frac{3}{8} + 2\frac{2}{3}}{\frac{5}{6} - \frac{7}{12}}$$

$$46) \frac{\frac{10}{18} + \frac{8}{15}}{\frac{20}{45} - \frac{32}{90}}$$

47) Assume the speed of light is 186,000 miles per second. Use the formula, distance = rate x time, to determine the distance you would travel at the speed of light if you traveled for 1 hour. Express the final answer in scientific notation.

48) Assuming that sound travels at a speed of 0.2 mile per second, how long does it take for sound to travel a distance of 5 miles? Express the answer in scientific notation.