

Scientific Notation Worksheet

$$1) \frac{3^{-3}}{1} = \frac{1}{3^3} = \frac{1}{27}$$

$$2) 8^3 \times 8^{-2} = 8^{3+(-2)} = 8^1 = 8$$

$$3) 6^9 \div 6^3 = 6^{9-3} = 6^6 = 46656$$

$$4) (3^2)^0 = 1$$

$$5) \left(\frac{1}{2}\right)^{-4} (2a^3)^3 (4a)^{-2}$$

$$\frac{(2)^4 \cdot (2^3 a^{3 \cdot 3}) (4^{-2} a^{-2})}{(1)}$$

$$\frac{2^4 \cdot 2^3 a^9}{4^2 a^2} = \frac{2^{4+3} a^{9-2}}{4^2} = \frac{2^7 a^7}{4^2} = \frac{128 a^7}{16} = 8a^7$$

$$6) (-3 \times 8^3 y^3 z^{-4})^4 \div (4 \times 2^{-4} y^{-4} z^{-2})^2$$

$$(-3)^4 \times 8^{3 \cdot 4} y^{3 \cdot 4} z^{-4 \cdot 4} \div (4)^2 \times 2^{2 \cdot 2} y^{-4 \cdot 2} z^{-2 \cdot 2}$$

$$(-3)^4 \times 32 y^{12} z^{-16} \div 4^2 \times 4 y^{-8} z^{-4}$$

$$\frac{(-3)^4 \times 32 y^{12} z^{-16}}{4^2 \times 4 y^{-8} z^{-4}}$$

$$\frac{(-3)^4 \times 32 y^{12-(-8)} z^{-16-(-4)}}{4^2}$$

$$\frac{81 \times 32 y^{20} z^{-12}}{16}$$

$$\frac{81 \times 2^8 y^{20} z^{-12}}{16}$$

$$\frac{81 \times 2^8 y^{20}}{16 z^{12}}$$

$$7) (2.28 \times 10^6) + (5.3 \times 10^5)$$

$$2.28 \times 10^6 + 0.53 \times 10^6$$

$$(2.28 + 0.53) \times 10^6$$

$$2.81 \times 10^6$$

$$8) (6.4 \times 10^3) + (6.5 \times 10^4)$$

$$0.64 \times 10^4 + 6.5 \times 10^4$$

$$7.14 \times 10^4$$

$$9) (4.8 \times 10^4) \div (6.4 \times 10^2)$$

$$\frac{4.8 \times 10^4}{6.4 \times 10^2} = 0.75 \times 10^{4-2}$$

$$= 0.75 \times 10^2$$

$$= 7.5 \times 10^1$$

$$10) (9.31 \times 10^5) - (4.2 \times 10^5)$$

$$5.11 \times 10^5$$

$$11) (5.41 \times 10^{-3}) - (8.1 \times 10^{-4})$$

$$(54.1 \times 10^{-4}) - (8.1 \times 10^{-4})$$

$$(54.1 - 8.1) \times 10^{-4}$$

$$46 \times 10^{-4} = 4.6 \times 10^{-3}$$

$$12) \begin{aligned} & (2.3 \times 10^4) \times (5.6 \times 10^3) \\ & (2.3 \times 5.6) (10^{4+3}) \\ & \underline{12.88} \times 10^{7+1} = 1.288 \times 10^8 \end{aligned}$$

$$13) \begin{aligned} & (4.7 \times 10^9) (1.3 \times 10^{-3}) \\ & 6.11 \times 10^{9+(-3)} \\ & 6.11 \times 10^{12} \end{aligned}$$

$$14) 221,000 = 2.21 \times 10^5$$

$$15) 4.05 \times 10^9 + 7.36 \times 10^8$$

$$\begin{aligned} & 4.05 \times 10^9 + .736 \times 10^9 \\ & = 4.786 \times 10^9 \end{aligned}$$

$$16) \frac{4.5 \times 10^9}{2.5 \times 10^5} = 1.8 \times 10^{9-5} = 1.8 \times 10^4$$

$$17) \frac{2.808 \times 10^7}{1.04 \times 10^5}$$

$$= 2.7 \times 10^{7-5} = 2.7 \times 10^2$$

$$18. \quad \underbrace{28000}_{+4} = 2.8 \times 10^4 + \underbrace{36}_{+1} \times 10^3$$

$$2.8 \times 10^4 + .36 \times 10^4$$

$$\boxed{3.16 \times 10^4}$$

$$19. \quad 4.5 \times 10^{12} - \underbrace{2.3}_{+1} \times 10^{11}$$

$$4.5 \times 10^{12} - .23 \times 10^{12}$$

$$\boxed{4.27 \times 10^{12}}$$