



I. Simplify the exponential expression, writing your answer as a fraction in simplest form.  
**LEAVE NO NEGATIVE EXPONENTS!**

<p>1. <math>10^{-2}</math></p> $\frac{1}{10^2}$ $\left(\frac{1}{100}\right)$	<p>2. <math>\left(\frac{2}{5}\right)^{-3}</math></p> $\frac{2^{-3}}{5^{-3}}$ $\frac{5^3}{2^3}$ $\left(\frac{125}{8}\right)$	<p>3. <math>8^5(8^{-7})</math></p> $\frac{8^5}{8^7}$ $\frac{1}{8^2}$ $\left(\frac{1}{64}\right)$
<p>4. <math>(-10)^0 \cdot \frac{1}{3^{-3}}</math></p> $1 \cdot 3^3$ $(27)$	<p>5. <math>\left(\frac{1}{2^{-2}}\right)^{-3}</math></p> $(2^2)^{-3}$ $2^{-6}$ $\left(\frac{1}{2^6}\right) \text{ or } \left(\frac{1}{64}\right)$	<p>6. <math>\frac{3^{43}}{3^{40}}</math></p> $3^3$ $(27)$

II. Rewrite the expression with **positive exponents**.

<p>7. <math>(3x^9y^2)^4</math></p> $3^4 x^{36} y^8$	<p>8. <math>\left(\frac{x^6}{y^3}\right)^2 \left(\frac{y^{10}}{x^3}\right)^2</math></p> $\frac{x^{12}}{y^6} \cdot \frac{y^{20}}{x^6}$ $(x^6 y^{14})$	<p>9. <math>\frac{(2x^2)^3}{6x^4}</math></p> $\frac{2^3 x^6}{6x^4}$ $\frac{8x^2}{6}$ $\left(\frac{4x^2}{3}\right)$
<p>10. <math>6x^3 \cdot 3x^{-4}</math></p> $\frac{6x^3 \cdot 3}{x^4}$ $\left(\frac{18}{x}\right)$	<p>11. <math>(201x^6)^{-8} (201x^6)^8</math></p> $201^{-8} x^{-48} \cdot 201^8 x^{48}$ $\frac{201^8 x^{48}}{201^8 x^{48}}$ $(1)$	<p>12. <math>\frac{5a^2b^7}{(2ab)^{-3}}</math></p> $\frac{5a^2b^7}{2^{-3}a^{-3}b^{-3}}$ $2^3 \cdot 5 a^2 a^3 b^7 b^3$ $8 \cdot 5 a^5 b^{10}$ $(40a^5b^{10})$

$$13. \frac{8u^4v^8}{-2u^2v^{11}}$$

$$\frac{-4u^2}{v^3}$$

$$14. \left( \frac{4k^2m^2}{16k^5m^3} \right)^{-1}$$

$$\left( \frac{1}{4k^3m} \right)^{-1}$$

$$\frac{1^{-1}}{4^{-1}k^{-3}m^{-1}}$$

$$4k^3m$$

$$15. (-4x^{-3}y^4)^2(8x^2y^5)$$

$$(-4)^2x^{-6}y^8 \cdot 8x^2y^5$$

$$\frac{16 \cdot 8x^2y^5y^8}{x^6}$$

$$\frac{128y^{13}}{x^4}$$

$$16. \left( \frac{56x^{12}y^4}{8x^{-3}y^{15}} \right)^2$$

$$\left( \frac{7x^{15}}{y^{11}} \right)^2$$

$$\frac{49x^{30}}{y^{22}}$$

$$17. \frac{(3a^4b^2)^3}{9a^{-3}b^8}$$

$$\frac{3^{-3}a^{-12}b^{-6}}{9a^{-3}b^8}$$

$$\frac{a^3}{27 \cdot 3 \cdot 9a^{12}b^6b^8}$$

$$\frac{1}{243a^9b^{14}}$$

$$18. (-11)^{-2}y^0$$

$$\frac{1}{(-11)^2}$$

$$\frac{1}{121}$$

$$19. (-6a^3b)(2a^{-3}b^{-5})$$

$$-12a^0b^{-4}$$

$$\frac{-12}{b^4}$$

$$20. \frac{y^2z^{-6}}{436z^2y^9}$$

$$\frac{y^2}{4y^9z^2z^6}$$

$$\frac{1}{4y^7z^8}$$

$$21. (5p^{-3}q)^2(3p^8q^4)$$

$$5^2p^{-6}q^2 \cdot 3p^8q^4$$

$$\frac{25 \cdot 3q^2p^8q^4}{p^6}$$

$$75p^2q^6$$