

## Exponent Worksheets

**Directions:** Simplify each expression using the laws of exponents. Use the least number of bases possible and only positive exponents. When appropriate, express answers without parentheses or as equal to 1. All letters denote numbers.

1.	$4^5 \cdot 4^{-4} =$	
2.	$4^5 \cdot 4^{-3} =$	
3.	$4^5 \cdot 4^{-2} =$	
4.	$7^{-4} \cdot 7^{11} =$	
5.	$7^{-4} \cdot 7^{10} =$	
6.	$7^{-4} \cdot 7^9 =$	
7.	$9^{-4} \cdot 9^{-3} =$	
8.	$9^{-4} \cdot 9^{-2} =$	
9.	$9^{-4} \cdot 9^{-1} =$	
10.	$9^{-4} \cdot 9^0 =$	
11.	$5^0 \cdot 5^1 =$	
12.	$5^0 \cdot 5^2 =$	
13.	$5^0 \cdot 5^3 =$	
14.	$(12^3)^9 =$	
15.	$(12^3)^{10} =$	
16.	$(12^3)^{11} =$	
17.	$(7^{-3})^{-8} =$	
18.	$(7^{-3})^{-9} =$	
19.	$(7^{-3})^{-10} =$	
20.	$\left(\frac{1}{2}\right)^9 =$	
21.	$\left(\frac{1}{2}\right)^8 =$	
22.	$\left(\frac{1}{2}\right)^7 =$	

23.	$\left(\frac{1}{2}\right)^6 =$	
24.	$(3x)^5 =$	
25.	$(3x)^7 =$	
26.	$(3x)^9 =$	
27.	$(8^{-2})^3 =$	
28.	$(8^{-3})^3 =$	
29.	$(8^{-4})^3 =$	
30.	$(22^0)^{50} =$	
31.	$(22^0)^{55} =$	
32.	$(22^0)^{60} =$	
33.	$\left(\frac{1}{\pi}\right)^{-5} =$	
34.	$\left(\frac{1}{\pi}\right)^{-6} =$	
35.	$\left(\frac{1}{\pi}\right)^{-7} =$	
36.	$\frac{56^{-23}}{56^{-34}} =$	
37.	$\frac{87^{-12}}{87^{-34}} =$	
38.	$\frac{23^{-15}}{23^{-17}} =$	
39.	$(-2)^{-12} \cdot (-2)^1 =$	
40.	$\frac{2y}{y^3} =$	
41.	$\frac{5xy^7}{15x^7y} =$	
42.	$\frac{16x^6y^9}{8x^{-5}y^{-11}} =$	
43.	$(2^3 \cdot 4)^{-5} =$	
44.	$(9^{-8})(27^{-2}) =$	

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**Directions:** Simplify each expression using the laws of exponents. Use the least number of bases possible and only positive exponents. When appropriate, express answers without parentheses or as equal to 1. All letters denote numbers.

1.	$4^5 \cdot 4^{-4} =$	$4^1$
2.	$4^5 \cdot 4^{-3} =$	$4^2$
3.	$4^5 \cdot 4^{-2} =$	$4^3$
4.	$7^{-4} \cdot 7^{11} =$	$7^7$
5.	$7^{-4} \cdot 7^{10} =$	$7^6$
6.	$7^{-4} \cdot 7^9 =$	$7^5$
7.	$9^{-4} \cdot 9^{-3} =$	$\frac{1}{9^7}$
8.	$9^{-4} \cdot 9^{-2} =$	$\frac{1}{9^6}$
9.	$9^{-4} \cdot 9^{-1} =$	$\frac{1}{9^5}$
10.	$9^{-4} \cdot 9^0 =$	$\frac{1}{9^4}$
11.	$5^0 \cdot 5^1 =$	$5^1$
12.	$5^0 \cdot 5^2 =$	$5^2$
13.	$5^0 \cdot 5^3 =$	$5^3$
14.	$(12^3)^9 =$	$12^{27}$
15.	$(12^3)^{10} =$	$12^{30}$
16.	$(12^3)^{11} =$	$12^{33}$
17.	$(7^{-3})^{-8} =$	$7^{24}$
18.	$(7^{-3})^{-9} =$	$7^{27}$
19.	$(7^{-3})^{-10} =$	$7^{30}$
20.	$\left(\frac{1}{2}\right)^9 =$	$\frac{1}{2^9}$
21.	$\left(\frac{1}{2}\right)^8 =$	$\frac{1}{2^8}$
22.	$\left(\frac{1}{2}\right)^7 =$	$\frac{1}{2^7}$

23.	$\left(\frac{1}{2}\right)^6 =$	$\frac{1}{2^6}$
24.	$(3x)^5 =$	$3^5 x^5$
25.	$(3x)^7 =$	$3^7 x^7$
26.	$(3x)^9 =$	$3^9 x^9$
27.	$(8^{-2})^3 =$	$\frac{1}{8^6}$
28.	$(8^{-3})^3 =$	$\frac{1}{8^9}$
29.	$(8^{-4})^3 =$	$\frac{1}{8^{12}}$
30.	$(22^0)^{50} =$	$1$
31.	$(22^0)^{55} =$	$1$
32.	$(22^0)^{60} =$	$1$
33.	$\left(\frac{1}{11}\right)^{-5} =$	$11^5$
34.	$\left(\frac{1}{11}\right)^{-6} =$	$11^6$
35.	$\left(\frac{1}{11}\right)^{-7} =$	$11^7$
36.	$\frac{56^{-23}}{56^{-34}} =$	$56^{11}$
37.	$\frac{87^{-12}}{87^{-34}} =$	$87^{22}$
38.	$\frac{23^{-15}}{23^{-17}} =$	$23^2$
39.	$(-2)^{-12} \cdot (-2)^1 =$	$\frac{1}{(-2)^{11}}$
40.	$\frac{2y}{y^3} =$	$\frac{2}{y^2}$
41.	$\frac{5xy^7}{15x^7y} =$	$\frac{y^6}{3x^6}$
42.	$\frac{16x^6y^9}{8x^{-5}y^{-11}} =$	$2x^{11}y^{20}$
43.	$(2^3 \cdot 4)^{-5} =$	$\frac{1}{2^{25}}$
44.	$(9^{-8})(27^{-2}) =$	$\frac{1}{3^{22}}$

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