

Sprint 1

Simplify each item as much as possible. Answers should have only positive exponents. 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.	$(7^{-3})^{-8} =$

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.	$\left(\frac{1}{11}\right)^{-5} =$
34.	$\left(\frac{1}{11}\right)^{-6} =$
35.	$\left(\frac{1}{11}\right)^{-7} =$
36.	$\frac{56^{-23}}{56^{-34}} =$
37.	$\frac{87^{-12}}{87^{-34}} =$
38.	$\frac{23^{-15}}{23^{-17}} =$
39.	$(-2)^{-12} \cdot (-2)^1 =$

18.	$(7^{-3})^{-9} =$
19.	$(7^{-3})^{-10} =$
20.	$\left(\frac{1}{2}\right)^9 =$
21.	$\left(\frac{1}{2}\right)^8 =$
22.	$\left(\frac{1}{2}\right)^7 =$

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.	$(9^{-8})(27^{-2}) =$

Sprint 2

Simplify each item as much as possible. Answers should have only positive exponents. All letters denote numbers.

1.	$11^5 \cdot 11^{-4} =$
2.	$11^5 \cdot 11^{-3} =$
3.	$11^5 \cdot 11^{-2} =$
4.	$7^{-7} \cdot 7^9 =$
5.	$7^{-8} \cdot 7^9 =$
6.	$7^{-9} \cdot 7^9 =$
7.	$(-6)^{-4} \cdot (-6)^{-3} =$
8.	$(-6)^{-4} \cdot (-6)^{-2} =$
9.	$(-6)^{-4} \cdot (-6)^{-1} =$
10.	$(-6)^{-4} \cdot (-6)^0 =$
11.	$x^0 \cdot x^1 =$

23.	$\left(\frac{3}{7}\right)^5 =$
24.	$(18xy)^5 =$
25.	$(18xy)^7 =$
26.	$(18xy)^9 =$
27.	$(5 \cdot 2^{-2})^3 =$
28.	$(5 \cdot 2^{-3})^3 =$
29.	$(5 \cdot 2^{-4})^3 =$
30.	$(22^6)^0 =$
31.	$(22^{12})^0 =$
32.	$(22^{18})^0 =$
33.	$\left(\frac{4}{5}\right)^{-5} =$

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

34.	$\left(\frac{4}{5}\right)^{-6} =$
35.	$\left(\frac{4}{5}\right)^{-7} =$
36.	$\left(\frac{6^{-2}}{7^5}\right)^{-11} =$
37.	$\left(\frac{6^{-2}}{7^5}\right)^{-12} =$
38.	$\left(\frac{6^{-2}}{7^5}\right)^{-13} =$
39.	$\left(\frac{6^{-2}}{7^5}\right)^{-15} =$
40.	$\frac{42ab^{10}}{14a^{-9}b} =$
41.	$\frac{5xy^7}{25x^7y} =$
42.	$\frac{22a^{15}b^{32}}{121ab^{-5}} =$
43.	$(7^{-8} \cdot 49)^{-5} =$
44.	$(36^9)(216^{-2}) =$

Sprint 1 Solutions

Simplify each item as much as possible. Answers should have only positive exponents. 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.	$(7^{-3})^{-10} = 7^{30}$

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.	$\frac{5xy^7}{15x^7y} = \frac{y^6}{3x^6}$

20.	$\left(\frac{1}{2}\right)^9 = \frac{1}{2^9}$
21.	$\left(\frac{1}{2}\right)^8 = \frac{1}{2^8}$
22.	$\left(\frac{1}{2}\right)^7 = \frac{1}{2^7}$

42.	$\frac{16x^6y^9}{8x^{-5}y^{-11}} = 2x^{11}y^{20}$
43.	$(2^3 \cdot 4)^{-5} = \frac{1}{2^{25}}$
44.	$(9^{-8})(27^{-2}) = \frac{1}{3^{22}}$

Sprint 2 Solutions

Simplify each item as much as possible. Answers should have only positive exponents. All letters denote numbers.

1.	$11^5 \cdot 11^{-4} = 11^1$
2.	$11^5 \cdot 11^{-3} = 11^2$
3.	$11^5 \cdot 11^{-2} = 11^3$
4.	$7^{-7} \cdot 7^9 = 7^2$
5.	$7^{-8} \cdot 7^9 = 7^1$
6.	$7^{-9} \cdot 7^9 = 1$
7.	$(-6)^{-4} \cdot (-6)^{-3} = \frac{1}{(-6)^7}$
8.	$(-6)^{-4} \cdot (-6)^{-2} = \frac{1}{(-6)^6}$
9.	$(-6)^{-4} \cdot (-6)^{-1} = \frac{1}{(-6)^5}$
10.	$(-6)^{-4} \cdot (-6)^0 = \frac{1}{(-6)^4}$
11.	$x^0 \cdot x^1 = x^1$
12.	$x^0 \cdot x^2 = x^2$
13.	$x^0 \cdot x^3 = x^3$
14.	$(12^5)^9 = 12^{45}$
15.	$(12^6)^9 = 12^{54}$

23.	$\left(\frac{3}{7}\right)^5 = \frac{3^5}{7^5}$
24.	$(18xy)^5 = 18^5x^5y^5$
25.	$(18xy)^7 = 18^7x^7y^7$
26.	$(18xy)^9 = 18^9x^9y^9$
27.	$(5.2^{-2})^3 = \frac{1}{5.2^6}$
28.	$(5.2^{-3})^3 = \frac{1}{5.2^9}$
29.	$(5.2^{-4})^3 = \frac{1}{5.2^{12}}$
30.	$(22^6)^0 = 1$
31.	$(22^{12})^0 = 1$
32.	$(22^{18})^0 = 1$
33.	$\left(\frac{4}{5}\right)^{-5} = \frac{5^5}{4^5}$
34.	$\left(\frac{4}{5}\right)^{-6} = \frac{5^6}{4^6}$
35.	$\left(\frac{4}{5}\right)^{-7} = \frac{5^7}{4^7}$
36.	$\left(\frac{6^{-2}}{7^5}\right)^{-11} = 6^{22}7^{55}$
37.	$\left(\frac{6^{-2}}{7^5}\right)^{-12} = 6^{24}7^{60}$

16.	$(12^7)^9 = 12^{63}$
17.	$(7^{-3})^{-4} = 7^{12}$
18.	$(7^{-4})^{-4} = 7^{16}$
19.	$(7^{-5})^{-4} = 7^{20}$
20.	$\left(\frac{3}{7}\right)^8 = \frac{3^8}{7^8}$
21.	$\left(\frac{3}{7}\right)^7 = \frac{3^7}{7^7}$
22.	$\left(\frac{3}{7}\right)^6 = \frac{3^6}{7^6}$

38.	$\left(\frac{6^{-2}}{7^5}\right)^{-13} = 6^{26}7^{65}$
39.	$\left(\frac{6^{-2}}{7^5}\right)^{-15} = 6^{30}7^{75}$
40.	$\frac{42ab^{10}}{14a^{-9}b} = 3a^{10}b^9$
41.	$\frac{5xy^7}{25x^7y} = \frac{y^6}{5x^6}$
42.	$\frac{22a^{15}b^{32}}{121ab^{-5}} = \frac{2a^{14}b^{37}}{11}$
43.	$(7^{-8} \cdot 49)^{-5} = 7^{30}$
44.	$(36^9)(216^{-2}) = 6^{12}$