

# Section 1.2 – Exponents and the Order of Operations

## Problem Set 1

Simplify the following expressions.

1.  $n^{-2}$
2.  $\frac{6}{s^{-2}}$
3.  $\frac{4^{-3}}{16}$
4.  $t^2n^{-7} + 4t^6n$
5.  $\frac{7u^{12}v^3}{2u^{18}v}$
6.  $y^{-12} \cdot y^7$
7.  $g^2 \cdot g^{-3}$
8.  $\frac{t(s^{12} + v)}{t^{12}}$
9.  $a^3 \cdot a + b^4 \cdot b^{-7} \cdot a$
10.  $\frac{w^3x}{x^2} + wx^2 - \frac{3w^{10}}{w^7x}$
11.  $t^{-2}x^5 + t^{-2}x^5$
12.  $\frac{(x+2)^4}{(x+2)^5}$
13.  $\frac{9xy^5}{3y^7} + \frac{4x^2y^2 \cdot x^{-1}}{y^4}$
14.  $\frac{(3x-1)^4}{(3x-1)^3} - \frac{(2x+2)^7}{(2x+2)^6}$
15.  $\frac{k^3k^{-3}}{k^{-3}}$
16.  $\frac{x^3y^3(3x+y)^6}{x^2y^4(3x+y)^7}$

Write the following numbers in scientific notation.

17. 4200
18. -879000000
19. 0.000000398
20. -0.000079888
21. 986000000
22. -0.00000008
23. 789149000000000
24. 0.0028798
25. **speed of sound:** 340.29 meters per second
26. **distance from the Earth to the moon:** 238,900 miles
27. **population of Russia:** 143, 500, 000 people
28. **budget of the United States:** \$3, 800, 000, 000, 000

Write the following numbers in decimal notation.

29.  $9.11 \times 10^7$
30.  $3.0877 \times 10^{-2}$
31.  $5.36 \times 10^{12}$
32.  $-2.861 \times 10^7$
33.  $-1.001 \times 10^{12}$
34.  $3.111 \times 10^{-7}$
35.  $4.361 \times 10^{-3}$
36.  $-4 \times 10^{10}$
37. **mass of a proton:**  $1.6726 \times 10^{-27}$  kilograms
38. **Avogadro's number:**  $6.022 \times 10^{23}$  units per mole
39. **seconds in a year:**  $3.1536 \times 10^7$
40. **Newton's gravitational constant:**  $6.674 \times 10^{-11}$  N (m / kg)<sup>2</sup>