

# Section 1.2 – Exponents and the Order of Operations

## Problem Set 2

Simplify the following expressions.

- |  |  |  |   |
|--|--|--|---|
| 1. $t^3$   | 2. $\frac{3}{z^{-6}}$  | 3. $\frac{3^{-2}}{3^{-7}}$                       | 4. $\frac{14es^3}{2e^4} + \frac{4s^2e^2 \cdot s^{-1}}{e^3s^{-2}}$ |
| 5. $\frac{(4x-1)^7}{(4x-1)^2} - \frac{(4x+1)^3}{(4x+1)^4}$ | 6. $r^{-3} \cdot r^{-2}$                                     | 7. $\frac{u^7t^8(2u-t)^8}{u^2t^{14}(2u-t)^{17}}$ | 8. $\frac{t(r^{12} + s)}{st^2}$                                   |
| 9. $y^3 \cdot z^{-3} + y^4 \cdot z^{-3} \cdot y^{-1}$      | 10. $\frac{v^{-2}n^2}{v^{-3}} + 2vn^2 - \frac{v^{10}}{v^6n}$ | 11. $q^{-3}r^4 + r^{-2}r^7$                      | 12. $\frac{(2x-7)^9}{(2x-7)^{15}}$                                |
| 13. $x^3z^{-3} + 2x^{-6}z$                                 | 14. $\frac{4a^3b^7}{2^{-3}a^{18}b^{-4}}$                     | 15. $\frac{b^4b^{-9}}{b^{-12}}$                  | 16. $p^4 \cdot p^{-7}$  |

Write the following numbers in scientific notation.

- |               |               |                      |                  |
|---------------|---------------|----------------------|------------------|
| 17. 8900000   | 18. -42000    | 19. 0.00000000000891 | 20. -0.008798    |
| 21. 126000000 | 22. -0.000078 | 23. 1890790000000    | 24. 0.0000007844 |
25. **micrometers in a meter:** 1, 000, 000  
26. **core temperature of the sun:** 27, 000, 000° F  
27. **population of the world:** 7, 125, 000, 000 people  
28. **diameter of Jupiter:** 86,881 miles

Write the following numbers in decimal notation.

- |                           |                            |                             |                         |
|---------------------------|----------------------------|-----------------------------|-------------------------|
| 29. $4.1 \times 10^4$     | 30. $2.299 \times 10^{17}$ | 31. $-2.017 \times 10^{-6}$ | 32. $-1.21 \times 10^6$ |
| 33. $2.61 \times 10^{-7}$ | 34. $1.459 \times 10^{-4}$ | 35. $-4.01 \times 10^{10}$  | 36. $-6.2 \times 10^3$  |
37. **mass of a hydrogen atom:**  $1.67 \times 10^{-24}$  g  
38. **core temperature of the sun:**  $1.5 \times 10^7$  ° C  
39. **Planck's constant:**  $6.626 \times 10^{-34} \times 10^{-3}$  J·s  
40. **mass of a proton:**  $1.672 \times 10^{-27}$  kg