

# Practice 8-1

## Zero and Negative Exponents

Simplify each expression.

- |                          |                             |                              |                             |
|--------------------------|-----------------------------|------------------------------|-----------------------------|
| 1. $16^0$                | 2. $4^{-2}$                 | 3. $3^{-3}$                  | 4. $8^{-4}$                 |
| 5. $\frac{1}{2^{-5}}$    | 6. $\frac{4}{4^{-3}}$       | 7. $\frac{3}{6^{-1}}$        | 8. $\frac{2^{-1}}{2^{-5}}$  |
| 9. $3 \cdot 8^0$         | 10. $16 \cdot 2^{-2}$       | 11. $12^{-1}$                | 12. $-7^{-2}$               |
| 13. $16 \cdot 4^0$       | 14. $9^0$                   | 15. $\frac{32^{-1}}{8^{-1}}$ | 16. $\frac{9}{2^{-1}}$      |
| 17. $\frac{8^{-2}}{4^0}$ | 18. $\frac{9^{-1}}{3^{-2}}$ | 19. $5(-6)^0$                | 20. $(3.7)^0$               |
| 21. $(-9)^{-2}$          | 22. $(-4.9)^0$              | 23. $-6 \cdot 3^{-4}$        | 24. $\frac{7^{-2}}{4^{-1}}$ |

Evaluate each expression for  $a = -2$  and  $b = 6$ .

- |                     |                      |                          |                  |
|---------------------|----------------------|--------------------------|------------------|
| 25. $b^{-2}$        | 26. $a^{-3}$         | 27. $(-a)^{-4}$          | 28. $-b^{-3}$    |
| 29. $4a^{-3}$       | 30. $2b^{-2}$        | 31. $(3a)^{-2}$          | 32. $(-b)^{-2}$  |
| 33. $2a^{-1}b^{-2}$ | 34. $-4a^{-2}b^{-3}$ | 35. $3^{-2}a^{-2}b^{-1}$ | 36. $(3ab)^{-2}$ |

Simplify each expression.

- |                             |                              |                               |                                    |
|-----------------------------|------------------------------|-------------------------------|------------------------------------|
| 37. $x^{-8}$                | 38. $xy^{-3}$                | 39. $a^{-5}b$                 | 40. $m^2n^{-9}$                    |
| 41. $\frac{1}{x^{-7}}$      | 42. $\frac{3}{a^{-4}}$       | 43. $\frac{5}{d^{-3}}$        | 44. $\frac{6}{r^{-5}s^{-1}}$       |
| 45. $3x^{-6}y^{-5}$         | 46. $8a^{-3}b^2c^{-2}$       | 47. $15s^{-9}t^{-1}$          | 48. $-7p^{-5}q^{-3}r^2$            |
| 49. $\frac{d^{-4}}{e^{-7}}$ | 50. $\frac{3m^{-4}}{n^{-8}}$ | 51. $\frac{6m^{-8}n}{p^{-1}}$ | 52. $\frac{a^{-2}b^{-1}}{cd^{-3}}$ |

Write each number as a power of 10 using a negative exponent.

- |                        |                           |                            |                               |
|------------------------|---------------------------|----------------------------|-------------------------------|
| 53. $\frac{1}{10,000}$ | 54. $\frac{1}{1,000,000}$ | 55. $\frac{1}{10,000,000}$ | 56. $\frac{1}{1,000,000,000}$ |
|------------------------|---------------------------|----------------------------|-------------------------------|

Write each expression as a decimal.

- |               |               |                       |                       |
|---------------|---------------|-----------------------|-----------------------|
| 57. $10^{-5}$ | 58. $10^{-8}$ | 59. $4 \cdot 10^{-1}$ | 60. $6 \cdot 10^{-4}$ |
|---------------|---------------|-----------------------|-----------------------|

Evaluate each expression for  $m = 4$ ,  $n = 5$ , and  $p = -2$ .

- |              |                     |                        |               |
|--------------|---------------------|------------------------|---------------|
| 61. $m^p$    | 62. $n^m$           | 63. $p^p$              | 64. $n^p$     |
| 65. $m^pn$   | 66. $m^{-n}$        | 67. $p^{-n}$           | 68. $mn^p$    |
| 69. $p^{-m}$ | 70. $\frac{m}{n^p}$ | 71. $\frac{1}{n^{-m}}$ | 72. $-n^{-m}$ |