

Chapter 8

Simplify the expression. In exercises involving numerical bases only, write your answer using exponents.

- 8.1**
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|--------------------|--------------------|---------------------------|------------------------------|
| 1. $5^3 \cdot 5^4$ | 2. $6 \cdot 6^7$ | 3. $(-2)^3 \cdot (-2)^6$ | 4. $(2^8)^2$ |
| 5. $[(-4)^3]^2$ | 6. $(8 \cdot 4)^5$ | 7. $m^5 \cdot m^2$ | 8. $n^2 \cdot n^4 \cdot n^5$ |
| 9. $(y^3)^5$ | 10. $(-2x)^3$ | 11. $(3d^2)^3 \cdot 2d^2$ | 12. $(-4s^2)^3(2s^3)^6$ |
- 8.2**
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|---|--|--|--|
| 13. $\frac{8^7}{8^2}$ | 14. $\frac{4^6 \cdot 4^2}{4^3}$ | 15. $\left(-\frac{2}{3}\right)^5$ | 16. $10^{12} \cdot \frac{1}{10^7}$ |
| 17. $7^9 \cdot \left(\frac{1}{7}\right)^4$ | 18. $\frac{1}{t^9} \cdot t^{13}$ | 19. $\left(\frac{p}{q}\right)^7$ | 20. $\left(\frac{6x^9}{3y^4}\right)^2$ |
| 21. $\left(\frac{4y^5}{3}\right)^3 \cdot \frac{1}{y^6}$ | 22. $\left(\frac{2}{u^2}\right)^3 \cdot \left(\frac{3u^4}{z^2}\right)^4$ | 23. $\left(\frac{5x^3y^4}{2x^2y}\right)^2$ | 24. $\frac{6a^4b^5}{ab} \cdot \left(\frac{2ab}{a^2b^2}\right)^3$ |

8.3 Evaluate the expression.

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|-------------------------------------|------------------|------------------------|-----------------------------|
| 25. 3^{-4} | 26. $(-5)^{-3}$ | 27. 7^0 | 28. $4^{-5} \cdot 4^3$ |
| 29. $\left(\frac{1}{2}\right)^{-3}$ | 30. $(3^{-2})^3$ | 31. $\frac{1}{2^{-5}}$ | 32. $\frac{8^{-4}}{8^{-6}}$ |

8.3 Simplify the expression. Write your answer using only positive exponents.

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|-----------------------------|----------------------------|----------------------------|--------------------------------------|
| 33. y^{-10} | 34. $(3c)^{-4}$ | 35. $10b^{-3}c^5$ | 36. $(2d^5e^{-2})^{-3}$ |
| 37. $\frac{x^{-4}}{y^{-5}}$ | 38. $\frac{1}{6t^{-5}u^3}$ | 39. $\frac{3}{(-2z)^{-5}}$ | 40. $\frac{(2e)^{-4}g^5}{e^5g^{-3}}$ |

8.4 If the number is written in scientific notation, write it in standard form. If the number is written in standard form, write it in scientific notation.

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|-----------------------|---------------------------|------------------------|--------------------------|
| 41. 0.87 | 42. 378.4 | 43. 0.000359 | 44. 465,000,000 |
| 45. 5.3×10^5 | 46. 1.67×10^{-4} | 47. 8×10^{-6} | 48. 9.0001×10^2 |

8.4 Evaluate the expression. Write your answer in scientific notation.

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|---|--|---|
| 49. $\frac{3 \times 10^2}{8 \times 10^6}$ | 50. $(8.5 \times 10^{10})(3.7 \times 10^{-5})$ | 51. $\frac{2.4 \times 10^{-5}}{6 \times 10^{-8}}$ |
|---|--|---|

Graph the function.

- 8.5**
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|---------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| 52. $y = 3^x$ | 53. $y = 1.25^x$ | 54. $y = \left(\frac{9}{4}\right)^x$ | 55. $y = 5 \cdot 2^x$ |
| 56. $y = \frac{1}{3} \cdot 2^x$ | 57. $y = -\frac{1}{2} \cdot 5^x$ | 58. $y = -5 \cdot 2^x$ | 59. $y = -\frac{1}{3} \cdot 4^x$ |
- 8.6**
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|--|--|---|---|
| 60. $y = \left(\frac{1}{3}\right)^x$ | 61. $y = (0.2)^x$ | 62. $y = 3 \cdot (0.2)^x$ | 63. $y = 2 \cdot \left(\frac{1}{3}\right)^x$ |
| 64. $y = 4 \cdot \left(\frac{1}{3}\right)^x$ | 65. $y = \frac{1}{2} \cdot \left(\frac{1}{3}\right)^x$ | 66. $y = -2 \cdot \left(\frac{1}{3}\right)^x$ | 67. $y = -\frac{3}{4} \cdot \left(\frac{1}{3}\right)^x$ |

8.6 68. Tell whether the table represents an exponential function. If so, write a rule for the function.

x	-1	0	1	2	3
y	$\frac{5}{2}$	5	10	20	40