

In 1–12, evaluate the expression.

1. $\frac{7^5}{7^3}$

2. $\frac{6^5}{6^7}$

3. $\frac{18^6}{18^6}$

4. $\frac{(-5)^9}{5^9}$

5. $\frac{2^3}{2^{-4}}$

6. $\frac{4^5 \cdot 4^3}{4^6}$

7. $\frac{3^2 \cdot 3^4}{3^9}$

8. $\left(\frac{2}{3}\right)^3$

9. $\left(\frac{4}{5}\right)^2$

10. $\left(-\frac{1}{2}\right)^5$

11. $\left(\frac{11}{3}\right)^{-1}$

12. $\left(\frac{3}{2}\right)^{-2}$

In 13–24, simplify the expression.

13. $\left(\frac{x}{3}\right)^4$

14. $\frac{x^7}{x^2}$

15. $\left(\frac{2}{x}\right)^6$

16. $x^5 \cdot \frac{1}{x^8}$

17. $x^{12} \cdot \frac{1}{x^3}$

18. $\frac{2x^2y}{x^3y^2} \cdot \frac{4x^7y^2}{2x^3}$

19. $\frac{3xy^4}{2x^5y} \cdot \frac{6x^{-3}y^2}{4y}$

20. $\frac{-8x^6y^{-3}}{3x^{-2}y^{-5}} \cdot \frac{-6x^{-10}y}{-4x}$

21. $\frac{4x^{-2}y^{-1}}{3x^{-3}} \cdot \frac{6x^{-3}y^{-2}}{8y^{-7}}$

22. $\frac{(4x^2y^3)^{-1}}{3y} \cdot \frac{(2xy^2)^2}{x^{-3}}$

23. $\left(\frac{2x^2y}{3y}\right)^{-3} \cdot \left(\frac{4y^3}{x^4}\right)^2$

24. $\frac{5x^{-1}y^3}{xy^{-4}} \cdot \frac{(-2x^2)^{-3}}{y}$

25. **Personal Computers** From 1982 to 1992, the cost of manufacturing a PC has decreased by about the same percentage each year. The cost, C (in dollars), in year t can be modeled by $C = 3000\left(\frac{5}{6}\right)^t$ where $t = 0$ corresponds to 1982. Find the ratio of the cost in 1990 to the cost in 1985.

26. **Assembly Speed** An assembly line worker increases the speed at which he can work by approximately the same percentage for the first 7 months of employment. The speed, s (in parts assembled per hour), in t months can be modeled by $s = 10(1.01)^t$ where $t = 0$ corresponds to the month a worker is hired. Find the ratio of the speed of a worker after 7 months of experience to the speed of a worker after 4 months of experience.