

Name _____ Date _____ Period _____

Simplify without using a calculator. Show all work.

1. $3^2 =$

2. $5^{-2} =$

3. $\frac{1}{6^{-3}} =$

4. $\left(\frac{1}{5}\right)^3 =$

5. $\left(\frac{1}{7}\right)^{-2} =$

6. $3x^2 =$

7. $(3x)^2 =$

8. $x^4x^2 =$

9. $\frac{x^5}{x^3} =$

10. $64^{\frac{5}{3}} =$

11. $\frac{1}{4^{-\frac{3}{2}}} =$

12. $(25)^{\frac{3}{2}} =$

13. $(4x^2)(-2x^5)$

14. $\frac{-20x^8}{4x^3}$

15. $\left(\frac{x^4}{x^3}\right)^2$

16. $7^{\frac{1}{2}}$

17. $8^{\frac{2}{3}}$

18. $27^{\frac{1}{3}}$

Solve each equation. Show your work!!

19. $7^2 = 7^x$

20. $4^{-2x-2} = 4^{3x}$

21. $3^{-2x} = 27$

22. $5^{2x} = \frac{1}{25}$

23. $\left(\frac{1}{4}\right)^{-2x-1} = 16$

24. $81^{-x+3} = \frac{1}{3}$

25. $8^n = \frac{1}{2}$

26. $2^{-x-3} = 2^{x-2}$

27. $81^{3x} = \left(\frac{1}{9}\right)^{2-2x}$

28. $4^{(1-2x)} = 2$

29. $8^{(6+3x)} = 4$

30. $9^x = 3^{x-1}$

31. $\left(\frac{1}{2}\right)^{3-x} = 8^3$

32. $5^x = 25^{3-2x}$

33. $\left(\frac{1}{9}\right)^x = 27$

34. $16^{x+1} = 4^3$

35. $\frac{1}{5^x} = 25$