

Simplify the following. Write all answers with positive exponents.

1. x^4x^5

11. $2b^0b^{-2}$

2. 3^53^0

12. $(4t^2)(2t)(t^3)(2t^4)$

3. $(-2)^2 \cdot (-2)^5$

13. $\left(\frac{a^3}{b^4}\right)^2$

4. $-2^2 \cdot (-2)^5$

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

5. $a^{-4}a^7$

15. $\left(\frac{s^3}{t^2}\right)^{-3}$

6. $z^2z^3z^5z^4$

16. $(ab)^{-2}$

7. 3^{-3}

17. $(x^2yz^3)^2 \cdot (xy^2)$

8. $(-2)^{-3}$

18. $3\left(\frac{x^6}{5y^8}\right)^3$

9. a^4a^{-7}

19. $(2a)^2 \cdot (a^3bc^3) \cdot (abc)^0$

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

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

Answers:

1. x^9

2. $3^5 = 243$

3. $(-2)^7 = -128$

4. $= 128$

5. a^3

6. z^{14}

7. $\frac{1}{3^3} = \frac{1}{27}$

8. $\frac{1}{(-2)^3} = \frac{1}{-8}$

9. $\frac{1}{a^3}$

10. $\left(\frac{3}{2}\right)^2 = \frac{9}{4}$

11. $\frac{2}{b^2}$

12. $16t^{10}$

13. $\frac{a^6}{b^8}$

14. $\frac{1}{x^6y^{12}}$

15. $\frac{t^6}{s^9}$

16. $\frac{1}{a^2b^2}$

17. $x^5y^4z^6$

18. $\frac{3x^{18}}{125y^{24}}$

19. $4a^5bc^3$

20. $\frac{1}{w^2}$