

6.1 Practice A

In Exercises 1–6, evaluate the expression. Show all work for full credit.

1. $(-3)^0$
 $\boxed{1}$

2. 7^0
 $\boxed{1}$

3. $3^{-5} = \frac{1}{3^5} = \boxed{\frac{1}{243}}$

4. $(-5)^{-3}$
 $= \frac{1}{(-5)^3} = \boxed{\frac{1}{-125}}$

5. $\frac{3^{-2}}{9^0} = \frac{3^{-2}}{1} = \frac{1}{3^2} = \boxed{\frac{1}{9}}$

6. $\frac{6^{-1}}{-5^0} = \frac{6^{-1}}{-1} = \boxed{\frac{1}{-6}}$

In Exercises 7–18, simplify the expression. Write your answer using only positive exponents. Show all work for full credit.

7. x^{-6}
 $= \frac{1}{x^6}$

8. z^0
 $\boxed{1}$

9. $7x^{-4}y^0$
 $= \frac{7}{x^4}$

10. $12f^0g^{-9}$
 $= \frac{12}{g^9}$

11. $\frac{3^{-2}a^0}{b^{-2}}$
 $= \frac{b^2}{9}$

12. $\frac{6^0tu^{-5}}{2^5}$
 $= \frac{t}{32u^5}$

13. $\frac{4^7}{4^4} = 4^{7-4}$
 $= 4^3$
 $= \boxed{64}$

14. $\frac{(-3)^6}{(-3)^3} = (-3)^{6-3}$
 $= (-3)^3$
 $= \boxed{-27}$

15. $(-8)^3 \cdot (-8)^3$
 $= (-8)^{3+3}$
 $= (-8)^6$
 $= \boxed{262,144}$

16. $7^{-4} \cdot 7^4$
 $= 7^{-4+4}$
 $= 7^0$
 $= \boxed{1}$

17. $(h^3)^4$
 $= h^{3 \cdot 4}$
 $= \boxed{h^{12}}$

18. $(t^{-2})^6$
 $= t^{(-2)(6)}$
 $= t^{-12}$
 $= \boxed{\frac{1}{t^{12}}}$

19. A camera lens magnifies an object 10^3 times. The length of an object is 10^{-4} centimeter. What is its magnified length?

$$(10^3)(10^{-4}) = 10^{3-4} = 10^{-1} = \boxed{\frac{1}{10} \text{ cm}}$$

In Exercises 20–22, simplify the expression. Write your answer using only positive exponents. Show all work for full credit.

$$\begin{aligned} 20. & (-2y)^5 \\ & = (-2)^5 (y^5) \\ & = \boxed{-32y^5} \end{aligned}$$

$$\begin{aligned} 21. & (3d)^{-3} \\ & = (3)^{-3} (d)^{-3} \\ & = \left(\frac{1}{27}\right) \left(\frac{1}{d^3}\right) \\ & = \boxed{\frac{1}{27d^3}} \end{aligned}$$

$$\begin{aligned} 22. & \left(\frac{5}{b}\right)^{-3} \\ & = \left(\frac{b}{5}\right)^3 \\ & = \left(\frac{b^3}{5^3}\right) = \boxed{\frac{b^3}{125}} \end{aligned}$$

In Exercises 23 and 24, simplify the expression. Write your answer using only positive exponents. Show all your work for full credit.

$$\begin{aligned} 23. & \left(\frac{3x^2y^{-3}}{2x^{-3}y^2}\right)^3 \\ & = \left(\frac{3x^2x^3}{2y^2y^3}\right)^3 \\ & = \left(\frac{3x^5}{2y^5}\right)^3 \\ & = \frac{(3)^3 (x^5)^3}{(2)^3 (y^5)^3} = \boxed{\frac{27x^{15}}{8y^{15}}} \end{aligned}$$

$$\begin{aligned} 24. & \left(\frac{-6a^{-9}b^5}{2a^2b^{-4}}\right)^4 \\ & = \left(\frac{-6b^4b^5}{2a^9a^2}\right)^4 \\ & = \left(\frac{-3b^9}{a^{11}}\right)^4 \\ & = \frac{(-3)^4 (b^9)^4}{(a^{11})^4} = \boxed{\frac{81b^{36}}{a^{44}}} \end{aligned}$$

In Exercises 25 and 26, evaluate the expression. Write your answer in scientific notation and standard form. Show all work for full credit.

$$\begin{aligned} 25. & (1.2 \times 10^7)(4 \times 10^{-2}) \\ & = (1.2)(4) \times 10^{7-2} \\ & = \boxed{4.8 \times 10^5} \\ & = \boxed{480,000} \end{aligned}$$

$$\begin{aligned} 26. & \frac{3.9 \times 10^8}{1.3 \times 10^3} \\ & = \frac{3.9}{1.3} \times 10^{8-3} \\ & = \boxed{3 \times 10^5} \\ & = \boxed{300,000} \end{aligned}$$