

WRITTEN EXERCISES

Simplify each expression.

- A**
1. a. $(-4)^{-2}$ b. -4^{-2}
 2. a. $(-3)^{-4}$ b. -3^{-4}
 3. a. $5 \cdot 2^{-3}$ b. $(5 \cdot 2)^{-3}$
 4. a. $2 \div 4^{-3}$ b. $(2 \div 4)^{-3}$
 5. a. $(x^{-2})^{-1}$ b. $((x^{-2})^{-1})^0$
 6. a. $(2x^{-3})^{-4}$ b. $2x^{-3} \cdot x^{-4}$
 7. a. $(3a^{-1})^{-1}$ b. $(3 + a^{-1})^{-1}$
 8. a. $(5x^2 \cdot x^{-2})^2$ b. $(5x^2 + x^{-2})^2$
 9. a. $(2^{-2} + 2^{-3})^{-1}$ b. $(2^{-2} \cdot 2^{-3})^{-1}$
 10. a. $(4^{-1} - 2^{-1})^2$ b. $(4^{-1} \div 2^{-1})^2$
 11. a. $(a^{-1} - b^{-1})^{-1}$ b. $(a^{-1} \cdot b^{-1})^{-1}$
 12. a. $(2 + x^{-2})^{-2}$ b. $(2 \cdot x^{-2})^{-2}$

Copy and complete the table. The cost of each item grows exponentially.

	Item	Annual rate of increase	Cost now	Cost in 10 years	Cost in 20 years
13.	Airplane ticket	15%	\$300	?	?
14.	Swim suit	8%	\$35	?	?
15.	Jar of mustard	7%	\$1	?	?
16.	College tuition	10%	\$12,000	?	?

Copy and complete the table. The value of each item decays exponentially.

	Item	Annual rate of decrease	Value now	Value in 3 years	Value in 6 years
17.	Farm tractor	25%	\$65,000	?	?
18.	Industrial equipment	10%	\$200,000	?	?
19.	Value of the dollar	6%	\$1	?	?
20.	Value of the dollar	8%	\$1	?	?

Simplify each expression.

21. $(3a^{-2})^3 \cdot 3a^5$
22. $(-4x^3)^2 \cdot 3x^{-2}$
23. $(3n^2)^{-1} (3n^2)^7$
24. $(2r^{-1})^4 (4r^2)^{-2}$
25. $\frac{(2a^{-1})^2}{(2a^{-1})^{-2}}$
26. $\frac{(-3n^{-3})^2}{-9n^{-4}}$
27. $\left(\frac{a}{b^2}\right)^{-2} \left(\frac{a}{b^2}\right)^{-3}$
28. $\frac{(-2r)^4}{(-2r)^{-2}}$
29. $2x^{-3}(x^5 - 2x^3)$
30. $xy^{-2}(xy^2 - 3y^3)$
31. $\frac{6a^{-2} + 9a^2}{3a^{-2}}$
32. $\frac{8n^4 - 4n^{-2}}{2n^{-2}}$