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LESSON
7.1

## Challenge Practice

## In Exercises 1-5, simplify the expression, if possible. Write your answer as a power.

1. $a^{x / 3} a^{3}$
2. $\left(a^{2} b\right)^{5 y} \cdot\left(a b^{2}\right)^{2 y}$
3. $\left(x^{1 / 2} \cdot y^{1 / 4}\right)^{2}$
4. $\left[(x y)\left(x^{3} y^{5}\right)\right]^{2}$
5. $(x+2)^{2 a+1} \cdot(x+2)^{3 a-5}$

## In Exercises 6-9, use the following information.

You are constructing a storage bin to hold bird seed. You decide the length, width, and height of the bin will each have a length of $a$ feet.
6. Write an expression that gives the volume of the storage bin in terms of $a$.
7. Suppose the length and width of the storage bin are doubled. By what factor would the height of the bin have to change so that the volume of the bin remains the same?
8. Suppose the length of the original storage bin is tripled and the width of the storage bin is halved. By what factor would the height of the bin have to change so that the volume of the bin is doubled?
9. Suppose the length, width, and height of the bin each have 1 foot added to them. Write an expression for the volume of the storage bin.
10. An exam has 10 true-false questions and 10 multiple choice questions. Each multiple choice question has 6 possible answers. Assuming a student guesses at each question on the exam, write an exponential expression for the number of different ways it is possible to answer the 20 questions.
11. Using the fact that $6=2 \cdot 3$, write the expression from Exercise 10 as powers of 2 and 3.

