Module 5   **Decimal Operations, Exponents, and Powers**
Lesson 6   **Powers and Exponents**

Write in exponential form.

1. $4 \times 4 \times 4 \times 4 \times 4$
4^5

2. $3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$
3^7

Evaluate.

3. 2^8
256

4. 3^3
27

5. -4^2
-16

6. $(-3)^4$
81

7. 2 to the 4th power
16

8. 9 to the 2nd power
81

9. $-5^2 \times (-3)^2$
-225

10. $(-2)^3 \times -2^2$
32

11. $-(6 - 1)^2$
-25

12. $2(-4 - 2)^2$
72

13. $8^2 - 2^4$
48

14. $2^5 - 4^3$
-32

15. $3^3 \times 7^0$
27

16. $-4^0 \times 5^3$
-125

17. 2^{-3}
$\dfrac{1}{8}$

18. -7^{-2}
$-\dfrac{1}{49}$

19. A multiple choice test has five questions and the choices for each question are A, B, or C. How many different ways are there to answer all five questions?
243 different ways

20. On the first day, there were two snails in the fishbowl. If the number of snails doubled every month, how many snails were there after seven months?
256 snails

Journal

1. Explain how to write 64 as the factor, two, raised to a power.
2. Express the following product using exponents. Explain your procedure.
   $5^3 \times 5^6$
3. Evaluate the following expression. Explain your procedure.
   $9^2 - 2^7$
4. Evaluate each of the following expressions. Explain the differences between them.
   $4^2, -4^2, (-4)^2, -(-4)^2$

Cumulative Review

Evaluate each expression.

1. $0.7 + 0.7$
1.4

2. $2.8 + 1.9$
4.7

3. $3.95 + 0.46$
4.41

4. $5.99 + 0.3$
6.29

5. $0.6 - 0.06$
0.54

6. $1.4 - 0.14$
1.26

7. $8.78 - 2.912$
5.868

8. $10.3 - 4.52$
5.78

Independent Practice

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Multiply.

9. 1.6×5.4
      8.64

10. 0.004×0.009
       0.000036

11. 0.3×0.85
        0.255

12. 22.5×0.66
        14.85

Estimate and evaluate each expression and check for reasonableness of the answer.

13. $29 \div 40$
        $30 \div 40 = 0.75$
        $29 \div 40 \approx 0.75$
        $29 \div 40 = 0.725$

14. $18.8 \div 3$
        $18 \div 3 = 6$
        $18.8 \div 3 \approx 6$
        $18.8 \div 3 = 6.2\overline{6}$

15. $0.52 \div 1.3$
        $5 \div 15 = 0.\overline{3}$
        $0.52 \div 1.3 \approx 0.\overline{3}$
        $0.52 \div 1.3 = 0.4$

16. $0.96 \div 0.016$
        $100 \div 2 = 50$
        $0.96 \div 0.016 \approx 50$
        $0.96 \div 0.016 = 60$

Possible Journal Answers

1. 2^6: $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$. Two is used as a factor six times, so I wrote two to the sixth power.

2. 5^9: I wrote each number in expanded form. Then, I counted how many times five was used as a factor. $5^3 \times 5^6 = (5 \times 5 \times 5) \times (5 \times 5 \times 5 \times 5 \times 5 \times 5)$. Five is used as a factor nine times, so I wrote five to the ninth power.

3. -47: I evaluated each expression and then subtracted the two answers. $9^2 = 81$ and $2^7 = 128$; $81 - 128 = -47$.

4. $4^2 = 4 \times 4 = 16$: Four is the base and it is raised to the second power.

   $-4^2 = -(4 \times 4) = -16$: I raise four to the second power, and then take the opposite of that number.

   $(-4)^2 = (-4) \times (-4) = 16$: Negative four is the base and it is raised to the second power.

   $-(-4)^2 = -((-4) \times (-4)) = -16$: Negative four is the base. Raise four to the second power and then take the opposite of that number.