Unit 6, Lesson 12: Meaning of Exponents

1. Select **all** expressions that are equivalent to 64.

    A. 2^6

    B. 2^8

    C. 4^3

    D. 8^2

    E. 16^4

    F. 32^2

2. Select **all** the expressions that equal 3^4.

    A. 7

    B. 4^3

    C. 12

    D. 81

    E. 64

    F. 9^2

3. 4^5 is equal to 1,024. Evaluate the following expressions.

    a. 4^6 b. 4^4 c. $4^3 \cdot 4^2$

4. $6^3 = 216$. Using exponents, write three more expressions whose value is 216.

5. Find two different ways to rewrite $3xy + 6yz$ using the distributive property.
   (from Unit 6, Lesson 11)

6. Solve each equation.

    a. $a - 2.01 = 5.5$ b. $b + 2.01 = 5.5$ c. $10c = 13.71$ d. $100d = 13.71$
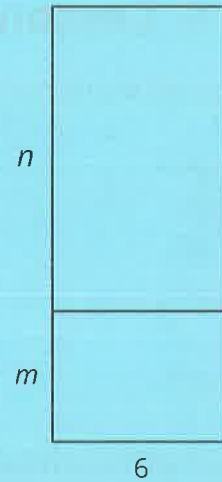
    (from Unit 6, Lesson 5)

7. Which expressions represent the total area of the large rectangle? Select **all** that apply.

A. $6(m + n)$

B. $6n + m$

C. $6n + 6m$

D. $6mn$

E. $(n + m)6$

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        ┌──────┐
        │      │
      n │      │
        │      │
        ├──────┤
      m │      │
        └──────┘
           6
```

(from Unit 6, Lesson 10)

8. Is each statement true or false? Explain your reasoning.

   a. $\frac{45}{100} \cdot 72 = \frac{45}{72} \cdot 100$

   b. 16% of 250 is equal to 250% of 16

(from Unit 3, Lesson 16)

Unit 6, Lesson 13: Expressions with Exponents

1. Select **all** expressions that are equal to $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$.

    A. $3 \cdot 5$

    B. 3^5

    C. $3^4 \cdot 3$

    D. $5 \cdot 3$

    E. 5^3

2. Noah starts with 0 and then adds the number 5 four times. Diego starts with 1 and then multiplies by the number 5 four times. For each expression, decide whether it is equal to Noah's result, Diego's result, or neither.

    a. $4 \cdot 5$

    b. $4 + 5$

    c. 4^5

    d. 5^4

3. Decide whether each equation is true or false, and explain how you know.

    a. $9 \cdot 9 \cdot 3 = 3^5$

    b. $7 + 7 + 7 = 3 + 3 + 3 + 3 + 3 + 3 + 3$

    c. $\frac{1}{7} \cdot \frac{1}{7} \cdot \frac{1}{7} = \frac{3}{7}$

    d. $4^1 = 4 \cdot 1$

    e. $6 + 6 + 6 = 6^3$

4.   a. What is the area of a square with side lengths of $\frac{3}{5}$ units?

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b. What is the side length of a square with area $\frac{1}{16}$ square units?

c. What is the volume of a cube with edge lengths of $\frac{2}{3}$ units?

d. What is the edge length of a cube with volume $\frac{27}{64}$ cubic units?

5. Select **all** the expressions that represent the area of the shaded rectangle.

A. $3(10 - c)$
B. $3(c - 10)$
C. $10(c - 3)$
D. $10(3 - c)$
E. $30 - 3c$
F. $30 - 10c$
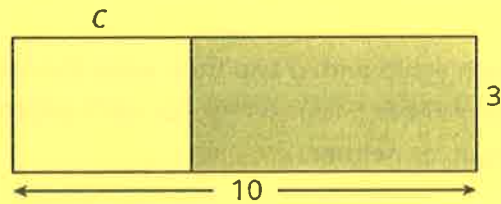
(from Unit 6, Lesson 10)

6. A ticket at a movie theater costs $8.50. One night, the theater had $29,886 in ticket sales.

a. Estimate about how many tickets the theater sold. Explain your reasoning.

b. How many tickets did the theater sell? Explain your reasoning.

(from Unit 5, Lesson 13)

7. A fence is being built around a rectangular garden that is $8\frac{1}{2}$ feet by $6\frac{1}{3}$ feet. Fencing comes in panels. Each panel is $\frac{2}{3}$ of a foot wide. How many panels are needed? Explain or show your reasoning.

(from Unit 4, Lesson 12)

Unit 6, Lesson 14: Evaluating Expressions with Exponents

1. Lin says, "I took the number 8, and then multiplied it by the square of 3." Select **all** expressions that equal Lin's answer.

    A. $8 \cdot 3^2$
    B. $(8 \cdot 3)^2$
    C. $8 \cdot 2^3$
    D. $3^2 \cdot 8$
    E. 24^2
    F. 72

2. Evaluate each expression.

    a. $7 + 2^3$

    b. $9 \cdot 3^1$

    c. $20 - 2^4$

    d. $2 \cdot 6^2$

    e. $8 \cdot (\frac{1}{2})^2$

    f. $\frac{1}{3} \cdot 3^3$

    g. $(\frac{1}{5} \cdot 5)^5$

3. Andre says, "I multiplied 4 by 5, then cubed the result." Select **all** expressions that equal Andre's answer.

    A. $4 \cdot 5^3$
    B. $(4 \cdot 5)^3$
    C. $(4 \cdot 5)^2$
    D. $5^3 \cdot 4$
    E. 20^3
    F. 500
    G. 8,000

4. Han has 10 cubes, each 5 inches on a side.

    a. Find the total volume of Han's cubes. Express your answer as an expression using an exponent.

    b. Find the total surface area of Han's cubes. Express your answer as an expression using an

exponent.

5. Priya says that $\frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} = \frac{4}{3}$. Do you agree with Priya? Explain or show your reasoning.

(from Unit 6, Lesson 13)

6. Answer each question. Show your reasoning.

    a. 125% of e is 30. What is e?   b. 35% of f is 14. What is f?

(from Unit 6, Lesson 7)

7. Which expressions are solutions to the equation $2.4y = 13.75$? Select **all** that apply.

    A. $13.75 - 1.4$
    B. $13.75 \cdot 2.4$
    C. $13.75 \div 2.4$
    D. $\frac{13.75}{2.4}$
    E. $2.4 \div 13.75$

(from Unit 6, Lesson 5)

8. Jada explains how she finds $15 \cdot 23$:

"I know that ten 23s is 230, so five 23s will be half of 230, which is 115. 15 is 10 plus 5, so $15 \cdot 23$ is 230 plus 115, which is 345."

    a. Do you agree with Jada? Explain.

    b. Draw a 15 by 23 rectangle. Partition the rectangle into two rectangles and label them to show Jada's reasoning.

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Unit 6, Lesson 15: Equivalent Exponential Expressions

1. Evaluate the following expressions if $x = 3$.

    a. 2^x

    b. x^2

    c. 1^x

    d. x^1

    e. $\left(\frac{1}{2}\right)^x$

2. Evaluate each expression for the given value of x.

    a. $2 + x^3$, x is 3

    b. x^2, x is $\frac{1}{2}$

    c. $3x^2$, x is 5

    d. $100 - x^2$, x is 6

3. Decide if the expressions have the same value. If not, determine which expression has the larger value.

    a. 2^3 and 3^2

    b. 1^{31} and 31^1

    c. 4^2 and 2^4

    d. $\left(\frac{1}{2}\right)^3$ and $\left(\frac{1}{3}\right)^2$

4. Match each equation to its solution.

    A. $7 + x^2 = 16$

    B. $5 - x^2 = 1$

    C. $2 \cdot 2^3 = 2^x$

    D. $\frac{3^4}{3^x} = 27$

    1. $x = 4$

    2. $x = 1$

    3. $x = 2$

    4. $x = 3$

5. An adult pass at the amusement park costs 1.6 times as much as a child's pass.

a. How many dollars does an adult pass cost if a child's pass costs:

$5? $10? w
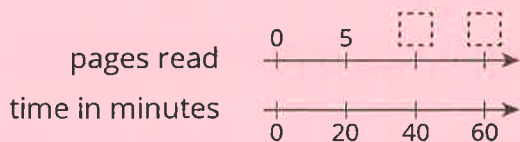
b. A child's pass costs $15. How many dollars does an adult pass cost?

(from Unit 6, Lesson 6)

6. Jada reads 5 pages every 20 minutes. At this rate, how many pages can she read in 1 hour?

a. Use a double number line to find the answer.

pages read

time in minutes

pages read	time in minutes
5	20

b. Use a table to find the answer.

c. Explain which strategy you thinks works better in finding the answer.

(from Unit 2, Lesson 14)