

Key

NAME

DATE

PERIOD

# Unit 6, Lesson 13: Expressions with Exponents

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

multiplied by self 5 times

- A.  $3 \cdot 5$  No
- B.  $3^5$  3<sup>4</sup>
- C.  $3^4 \cdot 3$   $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$
- D.  $5 \cdot 3$  No
- E.  $5^3$  No  $5 \cdot 5 \cdot 5$

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.

$5 \cdot 5 \cdot 5 \cdot 5$

- a.  $4 \cdot 5$  Noah
- b.  $4 + 5$  Neither
- c.  $4^5$  Neither
- d.  $5^4$  Diego

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

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

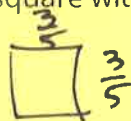
b.  $7 + 7 + 7 = 3 + 3 + 3 + 3 + 3 + 3 + 3$  True  
 $3(7) = 7(3)$

c.  $\frac{1}{7} \cdot \frac{1}{7} \cdot \frac{1}{7} = \frac{3}{7}$  No  $\frac{1}{7} \cdot \frac{1}{7} \cdot \frac{1}{7} = \frac{1}{343}$

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

e.  $6 \oplus 6 + 6 = 6^3$  False  
 should be  $3(6)$   
 $6 \cdot 6 \cdot 6 = 216$

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

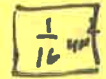


$\frac{3}{5} \cdot \frac{3}{5} = \frac{9}{25} \text{ un}^2$

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

$x^2 = \frac{1}{16}$   
 $x = \frac{1}{4}$   $4n$



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

$V = l \cdot h \cdot w$   
 $\frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} = \frac{8}{27} \text{ units}^3$

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

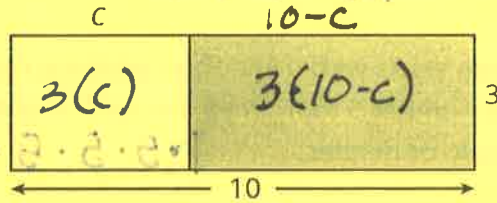
$x \cdot x \cdot x = \frac{27}{64}$  because  $\frac{3 \cdot 3 \cdot 3 = 27}{4 \cdot 4 \cdot 4 = 64}$

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.  $30 - 10c$

Factored

Multiplied Out



(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.

About 3,000  $3,000 \times 10 = 30,000$

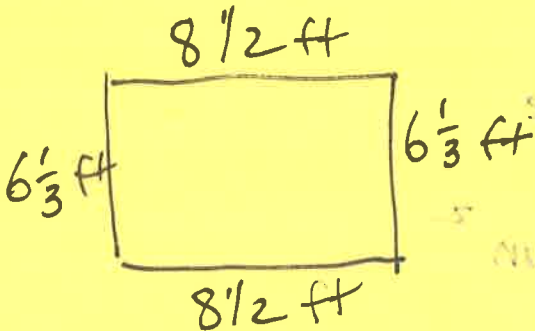
b. How many tickets did the theater sell? Explain your reasoning.

$8.50x = 29,886$   
 $x = \frac{29,886}{8.50} = 3516 \text{ tickets}$

(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)



Total perimeter  $2(8\frac{1}{2} + 6\frac{1}{3})$   
 $17 + 12\frac{2}{3} = 29\frac{2}{3} \text{ ft}$   
 $\frac{89}{3} \div \frac{2}{3} = \frac{89}{2} = 44\frac{1}{2}$

or 45 or 46

44 1/2 panels if you cut panels