2. **Evaluate $x - y$ if $x = 64$ and $y = 27$.**

$x - y = 64 - 27$ Replace x with 64 and y with 27.

$= 37$ Subtract 27 from 64.

$\frac{9}{1} \cdot \frac{1}{3} = \frac{9}{3} = 3$

3. **Evaluate $6x$ if $x = \frac{1}{2}$.**

$6x = 6 \cdot \frac{1}{2}$ Replace x with $\frac{1}{2}$.

$= 3$ Multiply 6 and $\frac{1}{2}$.

$9\left(\frac{1}{3}\right)$

Got It? **Do these problems to find out.**

Evaluate each expression if $a = 6$, $b = 4$, and $c = \frac{1}{3}$.

a. $a + 8$ **b.** $a - b$ **c.** $a \cdot b$ **d.** $9c$

Show your work.

$6 + 8 =$

a. 14

$6 - 4 =$

b. 2

$6 \cdot 4$

$= 24$

c.

$9\left(\frac{1}{3}\right)$

d. 3

To evaluate multi-step expressions, replace each variable with the correct value and follow the order of operations.

Examples

Tutor

4. **Evaluate $5t + 4$ if $t = 3$.**

$5t + 4 = 5 \cdot 3 + 4$ Replace t with 3.

$= 15 + 4$ Multiply 5 and 3.

$= 19$ Add 15 and 4.

5. **Evaluate $4x^2$ if $x = \frac{1}{8}$.**

$4x^2 = 4 \cdot \left(\frac{1}{8}\right)^2$ Replace x with $\frac{1}{8}$.

$= 4 \cdot \frac{1}{64}$ Simplify $\left(\frac{1}{8}\right)^2$.

$= \frac{1}{16}$ Multiply.

Guided Practice

Check

Evaluate each expression if $m = 4$, $z = 9$, and $r = \frac{1}{6}$. (Examples 1–6)

1. $3 + m$ 7

Show your work.

2. $z - m$ 5

PEMDAS

3. $12r$ 2

$(\frac{1}{6})(\frac{1}{6})$

4. $4m - 2$ 14

$4(4) - 2$

$16 - 2$

5. $60r - 4$ 6

$60(\frac{1}{6}) - 4$

$10 - 4$

6. $3r^2$ $\frac{1}{12}$

$3(\frac{1}{6})^2$

$= \frac{1}{3}(\frac{1}{6})(\frac{1}{6})$

$= \frac{1}{3}(\frac{1}{36})$

$= \frac{1}{108} = \frac{1}{12}$

7. The amount of money that remains from a 20-dollar bill after Malina buys 4 party favors for p dollars each is $20 - 4p$. Find the amount remaining if e

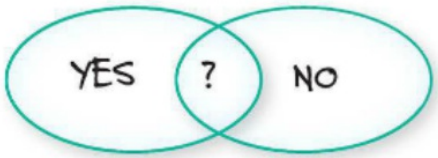
7. The amount of money that remains from a 20-dollar bill after Malina buys 4 party favors for p dollars each is $20 - 4p$. Find the amount remaining if each favor cost \$3. (Example 7) **\$8**

8. **Building on the Essential Question** How are numerical expressions and algebraic expressions different?

Sample answer: Numerical expressions include only numerical values and operations. Algebraic expressions can include numerical values, operations, and variables.

Rate Yourself!

Are you ready to move on? Shade the section that applies.



For more help, go online to access a Personal Tutor.

Independent Practice

Go online for Step-by-Step Solution

Evaluate each expression if $m = 2$, $n = 16$, and $p = \frac{1}{3}$. (Examples 1–6)

Show your work.

1. $m + 10$ **12**

2. $n \div 4$ **4**

3. $m + n$ **18**

4. $6m - 1$ **11**

5. $3p$ **1**

6. $12p$ **4**

7 $12m - 4$ **20**

8. $9p^2$ **1**

9. A paper recycling bin has the dimensions shown. Use the expression s^3, where s represents the length of a side, to find the volume of the bin. Write your answer in cubic meters. (Example 7)

$\frac{1}{8}$ m^3

a. What is the total cost for one individual admission and one individual movie pass on Family Night? **$14.50**

b. The expression $14.50x$ can be used to find the total cost for x tickets on Family Night for admission and the movie. What is the cost for 3 tickets? **$43.50**

11 Financial Literacy Julian earns $13.50 per hour. His company deducts 23% of his pay each week for taxes. Julian uses the expression $0.77(13.50h)$ to compute his earnings after taxes for the hours h he works. What will be his earnings after taxes, if he works 40 hours? **$415.80**

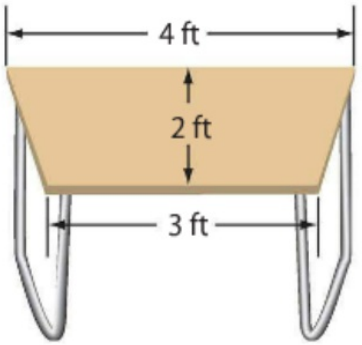
Evaluate each expression if $x = 3$, $y = 12$, and $z = 8$.

12. $4z + 8 - 6$ **34**

13. $7z \div 4 + 5x$ **29**

14. $y^2 \div (3z)$ **6**

15. CCSS **Be Precise** To find the area of a trapezoid, use the expression $\frac{1}{2}h(b_1 + b_2)$, where h represents the height, b_1 represents the length of the top base, and b_2 represents the length of the bottom base. What is the area of the trapezoidal table? **7 ft²**



H.O.T. Problems Higher Order Thinking

16. **Persevere with Problems** Isandro and Yvette each have a calculator. Yvette starts at 100 and subtracts 7 each time. Isandro starts at zero and adds 3 each time. If they press the keys at the same time, will their displays ever show the same number? If so, what is the number? **yes; 30**

17. **Reason Abstractly** Describe the difference between algebraic expressions and numerical expressions.
Sample answer: Both numerical expressions and algebraic expressions use operations. An algebraic expression, such as $6 + a$, includes numbers and variables, where a numerical expression, such as $6 + 3$, only includes numbers.

18. **Justify Conclusions** Complete the table of values to evaluate $5n$ and 5^n for the given values of n. Which will be greater when $n > 5$? Justify your response.

n	1	2	3	4
$5n$	$5 \times 1 = 5$	$5 \times 2 = 10$	$5 \times 3 = 15$	$5 \times 4 = 20$
5^n	$5^1 = 5$	$5^2 = 25$	$5^3 = 125$	$5^4 = 625$

5^n; Sample answer: The value of the expression 5^n grows at a faster rate than it does for $5n$ because each value is being multiplied by 5. In $5n$, 5 is added to each value. 5^n is repeated multiplication while $5n$ is repeated addition.