

Chapter 7 Review and Study Guide: Algebraic Reasoning

Objective: Use numbers and operation symbols to write verbal phrases as numerical expressions

For questions 1-2, translate each phrase into an algebraic expression.

- 1.) three less than a number $n - 3$ 2.) the product of a number and 8 $n \cdot 8$

Objective: Use the order of operations to evaluate expressions

PEMDAS

For questions 3-4, use the order of operations to evaluate each expression.

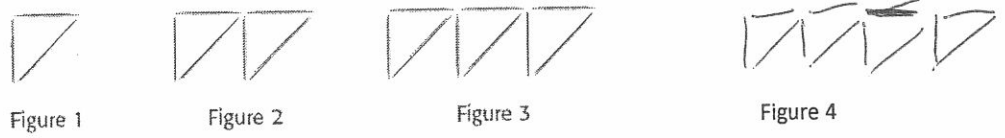
- 3.) $7 \times 8 + (24 \div 4) =$ 62 4.) $7 + (8 \times 9 + 7 + 70 \div 10) =$ 93

$$\begin{array}{r} 7 \times 8 + 6 \\ 56 + 6 \\ \hline 62 \end{array}$$

$$\begin{array}{r} 7 + (72 + 7 + 70 \div 10) \\ 7 + (72 + 7 + 7) \\ 7 + (79 + 7) \\ 7 + 86 \\ \hline 93 \end{array}$$

Objective: Generate numerical patterns and identify pattern relationships

5.) Draw figure 4. Then, complete the table at the right.



| Figure | Toothpicks |
|--------|------------|
| 1 | 3 |
| 2 | 6 |
| 3 | 9 |
| 4 | 12 |

6.) Karley added 14 bottle caps to her collection. She now has 54 bottle caps. Write and solve an equation to find the number of bottle caps she originally had.

$$14 + K = 54$$

$$\begin{array}{r} 54 \\ - 14 \\ \hline 40 \end{array}$$

$K = 40$ bottle caps

7.) 4 Travis and his three friends go to the baseball game. Each person buys a ticket for \$8, a snack for \$4, and a drink for \$2. Which numerical expression represents the total cost of the trip to the baseball game for Travis and his friends?

- A $4 + (\$8 \times \$4 \times \$2)$ B $4 \times (\$8 + \$4 + \$2)$
 C $(4 \times \$8) + (\$4 \times \$2)$ D $(4 \times \$8 + \$4) + (4 \times \$4 + \$2)$

Objective: Generate a rule from an input/output table

For questions 8-9, determine the rule used to generate each output number.

8.)

| In | Out |
|----|-----|
| 42 | 6 |
| 56 | 8 |
| 63 | 9 |
| 70 | 10 |
| 49 | 7 |

9.)

| In | Out |
|----|-----|
| 2 | 18 |
| 8 | 72 |
| 3 | 27 |
| 6 | 54 |
| 5 | 45 |

Rule = $\frac{in \div 7 = out}{n \div 7}$

Rule = $\frac{in \times 9 = out}{n \cdot 9}$

Objective: Identify and extend patterns and sequences

For questions 10-11, write the next three terms in each sequence.

10.) 7.3, 9.4, 11.5, 13.6, 15.7, 17.8 Rule = Add 2.1

11.) 0.03, 0.3, 3, 30, 300, 3000

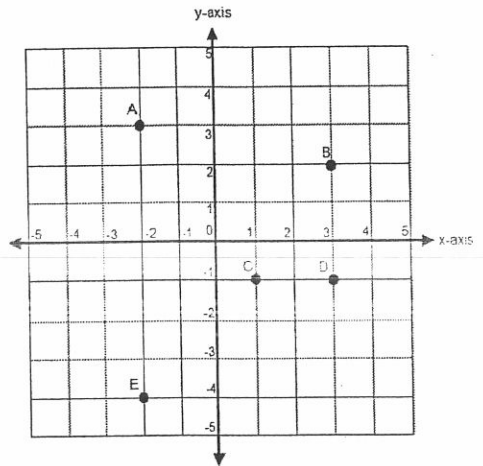
Objective: Identify and graph points on a coordinate plane

Use the coordinate grid to the right to answer questions 12-14.

12.) Name the coordinates for point D. (3, -1)

13.) Name the coordinates for point A. (-2, 3)

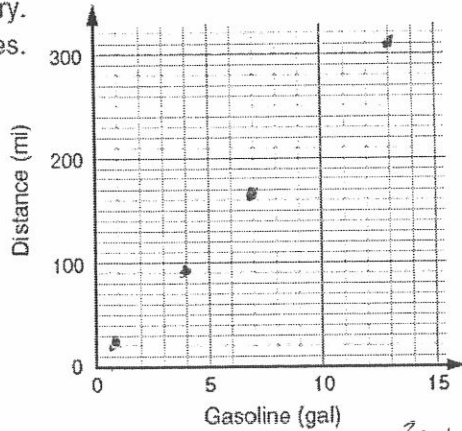
14.) What point is two units west and four units south of the origin? E
 $\frac{-2}{-4}$



Objective: Use a rule, table, or graph to solve problems

- 15.) Chantel is planning a trip to drive across country. Her car uses 1 gallon of gasoline every 24 miles.
 Rule: distance = 24 * number of gallons

| Gasoline (gal) (g) | Distance (mi) (24 * g) |
|--------------------|------------------------|
| 1 x 24 | 24 |
| 4 x 24 | 96 |
| 7 | 168 ÷ 24 |
| 13 x 24 | 312 |



$$\begin{array}{r} 13 \\ \times 24 \\ \hline 52 \\ 260 \\ \hline 312 \end{array}$$

- 16.) Plot a point to show the distance the car would travel on 6 gallons of gasoline. How many miles would it go? 144 miles

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \end{array}$$

Objectives: Evaluate whether an equation or inequality is true or false

For questions 17-18, determine whether each equation or inequality is true or false for $n = 8$

17.) $n + 3.4 = 11.4$ **true** false
 $8 + 3.4 = 11.4$

18.) $n - 3 > 5$ true **false**
 $8 - 3 = 5$

Objective: Evaluate variable expressions

For questions 19-20, Use the order of operations to evaluate each expression for $n = 4$.

19.) $2n + 1 = \underline{9}$

$$\begin{array}{r} 2 \cdot 4 + 1 \\ 8 + 1 \\ \hline 9 \end{array}$$

20.) $n \div 3 = \underline{1\frac{1}{3}}$

$$\begin{array}{r} 4 \div 3 \\ 3 \overline{)4} \\ \underline{-3} \\ 1 \end{array}$$