

# *The Dominican*

COMMUNITY *of* SCHOOLS

May, 2023

Dear Parents/Guardians,

The attached math enrichment packet is meant to provide your child with a review of the skills he/she learned in 7th grade. Your child is expected to turn the completed packet in to Ms. Buntin (8th grade) on the first day of the 2023-2024 school year. Please encourage your child to schedule time throughout the summer to work on the packet; do not wait until the end of summer to begin.

Reminders for your child:

- Read and follow all directions.
- Number each problem and show work for ANY/ALL problems in an organized manner to receive full credit.

Have a great summer!

Sincerely,

Mrs. Butler

## Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.
2. Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.
3. Add/subtract as if the numbers are whole numbers
4. Bring the decimal point straight down

ex:  $14.2 - 7.934$

$$\begin{array}{r} 14.200 \\ - 7.934 \\ \hline 6.266 \end{array}$$

## Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimal points do NOT need to be lined up.
2. Ignore the decimals and multiply as if the numbers are whole numbers.
3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has that same number of decimal places.

ex:  $6.94 \times 7.8$

$$\begin{array}{r} 6.94 \rightarrow 2 \text{ decimal places} \\ \times 7.8 \rightarrow 1 \text{ decimal place} \\ \hline 5552 \\ + 48580 \\ \hline 54132 \end{array}$$

3 decimal places

$$\boxed{54.132}$$

## Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.
2. Move the decimal point in the divisor after the number to turn it into a whole number and then move the decimal in the dividend the same number of places. Then bring it up.
3. Divide as if the numbers are both whole numbers.
4. Annex zeros in the dividend as needed until there is no remainder. If your answer is a repeating decimal, write the answer using bar notation.

ex:  $25.3 \div 0.3$

$$\begin{array}{r} \boxed{84.\bar{3}} \\ 0.3 \overline{) 25.30} \\ \underline{-24} \phantom{0} \\ 13 \phantom{0} \\ \underline{-12} \phantom{0} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

## Order of Operations

1. Grouping Symbols (parentheses, brackets, etc.)
2. Exponents
3. Multiplication & Division (left to right)
4. Addition & Subtraction (left to right)

ex:  $5 + 4(3 - 1.2)$

$$5 + 4(1.8)$$

$$5 + 7.2$$

$$\boxed{12.2}$$

## Adding Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.
2. Add the two numerators and keep the denominator the same.
3. Add the whole numbers.
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex:  $3\frac{3}{4} + 2\frac{1}{2}$

$$\begin{array}{r} 3\frac{3}{4} = 3\frac{3}{4} \\ + 2\frac{1}{2} = 2\frac{2}{4} \\ \hline 5\frac{5}{4} = \boxed{6\frac{1}{4}} \end{array}$$

## Subtracting Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.
2. Subtract the two numerators and keep the denominators the same.  
If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.
3. Subtract the whole numbers.
4. Simplify the answer.

ex:  $5\frac{1}{4} - 1\frac{2}{3}$

$$\begin{array}{r} 5\frac{1}{4} = 5\frac{3}{12} = 4\frac{15}{12} \\ - 1\frac{2}{3} = 1\frac{8}{12} = 1\frac{8}{12} \\ \hline \boxed{3\frac{7}{12}} \end{array}$$

## Multiplying Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.
2. Cross-simplify if possible.
3. Multiply the numerators and then multiply the denominators
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex:  $2\frac{1}{6} \cdot \frac{4}{7}$

$$\frac{13}{\cancel{36}} \cdot \frac{\cancel{4}^2}{7} = \frac{26}{21} = \boxed{1\frac{5}{21}}$$

## Dividing Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.
2. Keep the first fraction the same, change the division to multiplication, and flip the second fraction to its reciprocal.
3. Multiply the fractions.
4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex:  $7 \div 1\frac{3}{4}$

$$\begin{array}{r} 7 \\ \hline 1 \end{array} \div \frac{7}{4} \quad \downarrow$$

$$\frac{7}{1} \cdot \frac{4}{\cancel{7}_1} = \frac{4}{1} = \boxed{4}$$

# Ratios

Ratios are comparisons of two quantities.  
There are 3 different ways to write ratios:

- Fraction  $\left(\frac{A}{B}\right)$
- Colon (A:B)
- Word Form (A to B)

ex: write the ratio of triangles to circles  
in 3 ways:  $\triangle \triangle \triangle \triangle \circ \circ$

$$\frac{4}{2} = \frac{2}{1}, 2:1, 2 \text{ to } 1$$

Ratios can be simplified just like fractions.

# Rates & Unit Rates

Rates are ratios that compare quantities measured in different units.  
A unit rate is a rate with a denominator of 1.

ex: express as a unit rate:  
125 miles in 4 hours

To convert a rate to a unit rate:

1. Divide the numerator by the denominator
2. Either write your answer as a fraction with a label for the both the numerator and denominator OR as one number labeled with the first unit "per" the second unit

$$\frac{125 \text{ mi}}{4 \text{ hr}} \quad 125 \div 4 = 31.25$$

$$\frac{31.25 \text{ mi}}{1 \text{ hr}} \text{ or } 31.25 \text{ miles per hr}$$

# Fractions, Decimals, & Percent

To convert a:

- Decimal to Percent: move the decimal point 2 places to the right
- Percent to Decimal: move the decimal point 2 places to the left
- Decimal to Fraction: write the decimal over the place value of the last digit and then simplify
- Fraction to Decimal: divide the numerator by the denominator
- Percent to Fraction: write the percent over 100 and then simplify
- Fraction to Percent: convert the fraction to a decimal and then convert the decimal to a percent

ex:  $0.345 = 34.5\%$

ex:  $7\% = 0.07$

ex:  $0.008 = \frac{8}{1000} = \frac{1}{125}$

ex:  $\frac{1}{5} = 5 \overline{) 1.0} = 0.2$

ex:  $45\% = \frac{45}{100} = \frac{9}{20}$

ex:  $\frac{3}{10} = 0.3 = 30\%$

# Percent of a Number

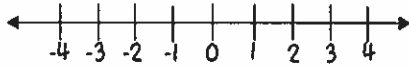
1. Turn the percent to a fraction or decimal.
2. Multiply the fraction/decimal by the number.

ex: Find 18% of 40

$$0.18 \cdot 40 = 7.2$$

# Comparing Integers

Integers are numbers without fractional parts. They can be positive, negative, or zero. The further right a number is on the number line, the greater it is.



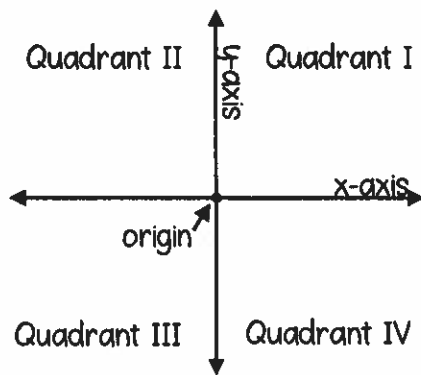
The absolute value of a number is the distance the number is from zero.

ex: compare with  $<$ ,  $>$ , or  $=$

$-7$    $|-9|$  ← The absolute value of  $-9 = 9$

$-7$    $<$   $9$

# The Coordinate Plane

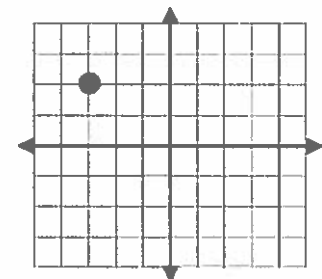


Ordered Pair:  $(x, y)$

To graph a point on the coordinate plane, start at the origin. The first number in the ordered pair (the x-coordinate) tells you how far left (if negative) or right (if positive) to move. The second number (the y-coordinate) tells you how far up (if positive) or down (if negative) to move.

ex: Graph the point  $(-3, 2)$  and state the quadrant in which it is located.

Start at the origin, and move LEFT 3 and UP 2



Quadrant II

# Perimeter, Area and Volume

- Perimeter of Any Polygon: add all side lengths

ex: Find the perimeter & area:

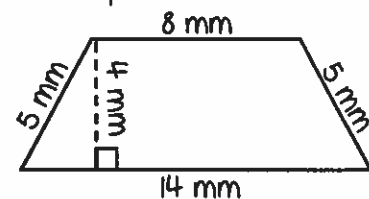
- Area of a Rectangle:  $A = lw$

- Area of Parallelogram:  $A = bh$

- Area of Triangle:  $A = \frac{1}{2}bh$

- Area of Trapezoid:  $A = \frac{1}{2}h(b_1 + b_2)$

- Volume of Rectangular Prism:  $V = lwh$



Perimeter:  $P = 5 + 8 + 5 + 14 = 32 \text{ mm}$

Area: This is a trapezoid, so use the area of a trapezoid

formula:  $A = \frac{1}{2}h(b_1 + b_2)$

The bases are the sides that are parallel, and the height is perpendicular to the bases.

→  $A = \frac{1}{2}(4)(8+14) = 44 \text{ mm}^2$

# Evaluating Algebraic Expressions

1. Substitute the given numbers for the variables
2. Evaluate the expression using the order of operations

ex: evaluate  $x + 4y$  for  
 $x = 4$  &  $y = 6$

$$\begin{array}{r} 4 + 4(6) \\ 4 + 24 = \boxed{28} \end{array}$$

# One-Step Addition & Subtraction Equations

- Addition Equations: Subtract the number being added to the variable from both sides of the equation

ex:  $4 + x = 18$

$$\begin{array}{r} 4 + x = 18 \\ -4 \quad -4 \\ \hline x = 14 \end{array}$$

- Subtraction Equations: Add the number being subtracted from the variable to both sides of the equation

ex:  $20 = a - 5$

$$\begin{array}{r} 20 = a - 5 \\ +5 \quad +5 \\ \hline 25 = a \rightarrow \boxed{a = 25} \end{array}$$

# One-Step Multiplication & Division Equations

- Multiplication Equations: Divide both sides of the equation by the number next to the variable

ex:  $7b = 28$

$$\begin{array}{r} 7b = 28 \\ \frac{7}{7} \quad \frac{7}{7} \\ \hline b = 4 \end{array}$$

- Division Equations: Multiply both sides of the equation by the number under the variable

ex:  $5 \frac{n}{5} = 10 \cdot 5$

$$\begin{array}{r} 5 \frac{n}{5} = 10 \cdot 5 \\ \frac{5}{5} \quad \frac{5}{5} \\ \hline n = 50 \end{array}$$

# Problem Solving

1. Read the problem. Identify the question that is being asked and the key information in the problem.
2. Plan how you are going to solve the problem and estimate the answer.
3. Solve the problem using the strategy of your choice.
4. Check your answer. Make sure your answer is reasonable and compare it to your estimate. Label your answer with appropriate units.

# Evaluating Algebraic Expressions

1. Substitute the given values for the variables in the expression
2. Evaluate the expression using the order of operations
  - Parentheses/Brackets (inside to outside)
  - Exponents
  - Multiplication/Division (left to right)
  - Addition/Subtraction (left to right)

ex:  $9x^2 - 4(y + 3z)$   
for  $x = -3, y = 2, z = 5$

$$9(-3)^2 - 4(2 + 3 \cdot 5)$$

$$9(-3)^2 - 4(2 + 15)$$

$$9(-3)^2 - 4 \cdot 17$$

$$9 \cdot 9 - 4 \cdot 17$$

$$81 - 4 \cdot 17$$

$$81 - 68 = \boxed{13}$$

# The Distributive Property

1. Multiply the number outside the parentheses by each term in the parentheses.
2. Keep the addition/subtraction sign between each term.

ex:  $5(8x - 3)$

$$5(8x - 3)$$

$$5(8x) - 5(3)$$

$$\boxed{40x - 15}$$

# Simplifying Algebraic Expressions

1. Clear any parentheses using the Distributive Property
2. Add or subtract like terms (use the sign in front of each term to determine whether to add or subtract)

ex:  $2(3x - 4) - 12x + 9$

$$2(3x - 4) - 12x + 9$$

$$6x - 8 - 12x + 9$$

$$\boxed{-6x + 1}$$

# Solving One-Step Equations

1. Cancel out the number on the same side of the equal sign as the variable using inverse operations (addition/subtraction; multiplication/division)
2. Be sure to do the same thing to both sides of the equation!

ex:  $-18 = 6j$

$$\frac{-18}{6} = \frac{6j}{6}$$

$$-3 = j \rightarrow \boxed{j = -3}$$

# Solving Two-Step Equations

1. Undo operations one at a time with inverse operations, using the order of operations in reverse (i.e. undo addition/subtraction before multiplication/division)
2. Be sure to always do the same thing to both sides of the equation!

ex:  $\frac{a}{7} - 12 = -9$

$$\frac{a}{7} - 12 = -9$$
$$+ 12 \quad + 12$$

$$\frac{a}{7} = 3$$
$$7 \times \frac{a}{7} = 3 \times 7$$

$$\boxed{a = 21}$$

# Solving Multi-Step Equations

1. Clear any parentheses using the Distributive Property
2. Combine like terms on each side of the equal sign
3. Get the variable terms on the same side of the equation by adding/subtracting a variable term to/from both sides of the equation to cancel it out on one side
4. The equation is now a two-step equation, so finish solving it as described above

ex:  $5(2x - 1) = 3x + 4x - 1$

$$10x - 5 = 3x + 4x - 1$$

$$10x - 5 = 7x - 1$$
$$- 7x \quad - 7x$$

$$3x - 5 = -1$$
$$+ 5 \quad + 5$$

$$3x = 4$$
$$\frac{3x}{3} = \frac{4}{3}$$

$$\boxed{x = \frac{4}{3}}$$



**UNIT**  
**1****The Number System****Unit Test: A**

- The temperature at noon was  $-3^{\circ}\text{C}$ . By 10 P.M. on the same day the temperature decreased by  $5.4^{\circ}$ . What was the temperature at 10 P.M.?  
A  $-8.4^{\circ}\text{C}$                       C  $-2.4^{\circ}\text{C}$   
B  $-5.4^{\circ}\text{C}$                       D  $1.6^{\circ}\text{C}$
- Derek spends \$3 on breakfast and \$5.50 on lunch every school day. How much does he spend on breakfast and lunch in a school week?  
A \$38.50                      C \$49.90  
B \$42.50                      D \$59.50
- What is the value of  $(-4.5)(-8.25)$ ?  
A  $-37.125$                       C  $3.75$   
B  $-12.75$                       D  $37.125$
- An artist is cutting pieces of ribbon to use in a project. Each piece he cuts measures  $\frac{7}{8}$  inch. The artist cuts off 5 pieces. How many total inches of ribbon has he cut off?  
A  $4\frac{1}{8}$                       C  $5\frac{5}{7}$   
B  $4\frac{3}{8}$                       D  $5\frac{7}{8}$
- An airplane took off and reached an altitude of 10,000 feet in 25 minutes. How many feet per minute, on average, did the airplane climb?  
A 400  
B 500  
C 600  
D 2,500
- The number of students enrolled at Hill School decreased by 120 students over an 8-year period. What was the average decrease in student enrollment per year?  
A 8                      C 15  
B 12                      D 20
- Alexis sold boxes of homemade granola bars for \$8.50 each. It costs her \$2.25 to bake and package each box of granola bars. What was her profit from selling each box of granola bars?  
A  $-\$6.25$   
B \$5.38  
C \$6.25  
D \$10.75
- Alexandra's backpack weighs  $7\frac{5}{8}$  pounds. What is the weight of her backpack expressed as a decimal?  
A 7.13                      C 7.625  
B 7.58                      D 7.85
- A sandwich costs \$4.25 and a fruit drink costs \$1.85. How much change will you get from a \$10 bill?  
A \$2.90                      C \$3.90  
B \$3.70                      D \$6.10
- Which of the following fractions is equivalent to a repeating decimal?  
A  $\frac{1}{5}$                       C  $\frac{2}{3}$   
B  $\frac{5}{8}$                       D  $\frac{3}{4}$

## The Number System

11. The elevation of New Orleans, Louisiana is on average 8 feet below sea level. The elevation of El Centro, California is 39 feet below sea level. What is the difference in elevation between the two cities?
- \_\_\_\_\_
12. Jalil mixed  $\frac{3}{8}$  cup of sugar with  $1\frac{5}{6}$  cups of water. How many more cups of water than sugar did he use in his mixture?
- \_\_\_\_\_
13. What is the product of  $-3.4$  and  $2.5$ ?
- \_\_\_\_\_
14. Fatima wants to purchase a scarf for \$45.00 and a sweater for \$77.50. If she currently has \$100, how much more money does she need to purchase the two items?
- \_\_\_\_\_
15. Arnaud paid \$350 for a rug. The price of the rug that Bill purchased was  $\frac{2}{5}$  the price that Arnaud paid. How much did Bill pay for his rug?
- \_\_\_\_\_
16. The Martin family spent \$518 on groceries in one week. What is the average amount the family spent on groceries per day?
- \_\_\_\_\_
17. What is the average of  $-2.5$ ,  $5.2$ ,  $1.7$ , and  $-0.8$ ?
- \_\_\_\_\_
18. What is the quotient of  $-5.2 \div 3.9$ ?
- \_\_\_\_\_
19. Gail read  $\frac{2}{15}$  of a book on Monday and  $\frac{3}{5}$  of the book on Tuesday. What fraction of the book did she read on Monday and Tuesday?
- \_\_\_\_\_
20. At Benito's school,  $\frac{5}{8}$  of the students like math class. If there are 208 students, how many of them like math?
- \_\_\_\_\_
21. Kevin is  $5\frac{1}{2}$  feet tall. Jane is  $5\frac{3}{8}$  feet tall. Who is taller? Justify your answer.
- \_\_\_\_\_
22. Beatrice built about  $\frac{1}{3}$  of a sandcastle. Linda built  $\frac{4}{7}$  of the same castle. What fraction of the sandcastle did they build together?
- \_\_\_\_\_
23. In Priya's math class there are 10 boys and 15 girls. What is the ratio of boys to girls in Priya's math class? Express your answer as a decimal.
- \_\_\_\_\_

UNIT  
1**The Number System****Performance Task****Of Kites and Fishing Hooks**

The heights of kites and the depths of fishing hooks can be recorded using positive and negative integers and rational numbers. Use the table below. Show your work.

Kite	Height (ft)	Fishing Hook	Depth (ft)
A	21	E	-7.1
B	35.4	F	-5.6
C	$28\frac{3}{4}$	G	$-6\frac{2}{3}$

1. Kite A is at a height of 21 feet. It ascends 15 feet. At what height is it now?

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2. Fishing Hook E is at -7.1 feet. It descends another 3.25 feet. What is its depth now?

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3. The string on Kite C is tripled. How high can Kite C fly now?

---

4. Fishing Hook E is dropped 2.5 times its present depth. Where is Fishing Hook E now?

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5. What is the distance from Kite C (in Exercise 3) to Fishing Hook E (in Exercise 4)?

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6. Fishing Hook G is let down  $2\frac{1}{2}$  times its present depth. Where is Fishing Hook G now?

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7. Write your own problem using the data in the table.

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**UNIT**  
**2**

**Ratios and Proportional Relationships**

**Unit Test: A**

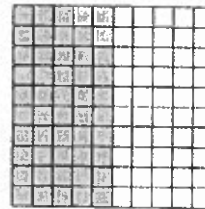
- A machine makes 300 boxes in 15 minutes. Which expression equals the unit rate in boxes per hour?  
 A  $300 \times 15$                       C  $300 \div 15$   
 B  $300 \times \frac{1}{4}$                         D  $300 \div \frac{1}{4}$
- The table shows a person saving money at a constant rate.

<b>Weeks</b>	2	4	6	8
<b>Total Savings (\$)</b>	60	120	180	240

How much is this person saving per week?

- A \$2                                      C \$60  
 B \$30                                     D \$120
- A student reads at a rate of 16 pages per day. Which ordered pair is **not** on the graph of this relationship?  
 A (0, 16)                                C (1.5, 24)  
 B (1, 16)                                D (2, 32)
  - Jesse bought 5.2 pounds of grapes for \$7.75. Using the unit rate, how much would 3 pounds of grapes cost?  
 A \$1.49                                  C \$4.47  
 B \$2.98                                  D \$12.22
  - What is the percent of increase for a population that changed from 25,000 to 30,000?  
 A 16.6%                                C 83.3%  
 B 20%                                     D 120%
  - A merchant buys a television for \$125 and sells it for \$75 more. What is the percent of markup?  
 A 37.5%                                C 62.5%  
 B 60%                                     D 160%

- How much interest is earned in 2 years on an investment of \$2,000? The interest rate is 3%.  
 A \$60                                    C \$600  
 B \$120                                  D \$1,200
- A quarter is what percent of a dollar?  
 A 4%                                      C 75%  
 B 25%                                    D 400%
- When you find more than 100% of a number, how does your answer relate to the original number?  
 A The numbers are equal.  
 B It is less than the original number.  
 C It is greater than the original number.  
 D There is no relationship.
- The relation of 50 squares to 100 squares can be expressed in many ways. Which of the following is **not** a way to express the relationship?



- A  $\frac{5}{10}$                                       C 0.05  
 B 50%                                    D 0.5

**UNIT**  
**2**

**Ratios and Proportional Relationships**

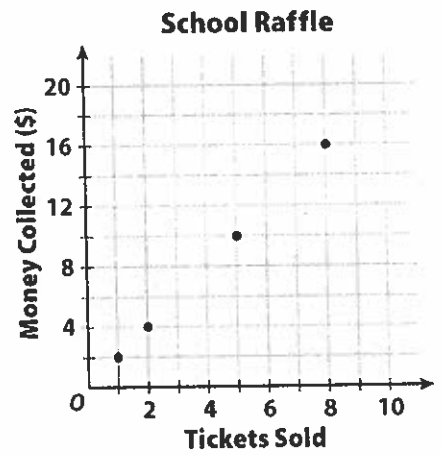
11. What is the unit price if 4 pounds of fruit cost \$6.48?

\_\_\_\_\_

12. The table shows the distance traveled by an object moving at a constant speed. How far will the object go in 1 minute?

<b>Seconds</b>	10	15	20
<b>Meters</b>	85	127.5	170

13. Write an equation for the relationship shown on this graph.



14. Find the percent of increase from 2005 to 2010.

<b>Year</b>	2000	2005	2010
<b>Population (millions)</b>	4.3	3.2	5.6

15. A keyboard that costs \$475 is marked down 15% for a sale. How much is the savings?

\_\_\_\_\_

16. A shopper bought shoes marked \$40. The sales tax is 8%. How much did the shopper pay in all?

\_\_\_\_\_

17. Explain why a straight line on a graph shows a constant rate of change.

\_\_\_\_\_

18. What is the constant rate of change shown in the table?

<b>Number of Shirts</b>	<b>Cost (\$)</b>
1	25
2	50
3	75
8	200

19. A store has a sale on pet supplies. The price,  $p$ , of each item is marked down 20%. Write an expression that represents the sale price.

\_\_\_\_\_

20. How would you show a rate of change of 60 miles per hour on a graph? Name some of the points.

\_\_\_\_\_

\_\_\_\_\_

**UNIT**  
**2** **Ratios and Proportional Relationships**  
**Performance Task**

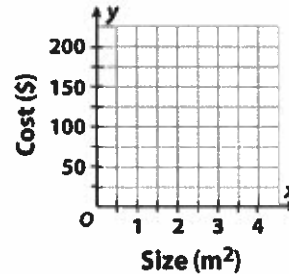
**In the Doghouse**

Two companies, Barkly and Woof-Woof, both sell doghouses. The cost of each doghouse depends on the size of its base.

Use the table and the blank graph below for 1–4.

1. Barkly Doghouses charges \$50 per square meter for their doghouses. Complete the table to show this proportional relationship.

Size (m <sup>2</sup> )	0.5	1	2.5	4
Cost (\$)				



2. Graph the proportional relationship.  
3. Write an equation to show the relationship in your table and graph. Use  $x$  for size and  $y$  for cost.

\_\_\_\_\_

4. Woof-Woof Doghouses charges half as much per square meter as Barkly. Draw the graph for Woof-Woof. Label both graphs with their equations.  
5. Barkly Doghouses increased their prices by 10%. Complete the chart below to show their new prices.

Size (m <sup>2</sup> )	0.5	1	2.5	4
Cost (\$)				

6. How will the graph change?

\_\_\_\_\_

7. Write an equation to show the new relationship.

\_\_\_\_\_

8. Woof-Woof decided to increase their prices by 40%. Complete the table to show their increased prices.

Size (m <sup>2</sup> )	0.5	1	2.5	4
Cost (\$)				

9. The town has decided to add a sales tax of 2.3%. Using the new price and the town tax, calculate the cost of a 2 square-meter doghouse from each company.

\_\_\_\_\_

**UNIT**  
**3**

**Expressions, Equations, and Inequalities**

**Unit Test: A**

1. Which is the first step in solving  $x - 4 = 4$ ?
- A Add 4 to the left side.
  - B Subtract 4 from the left side.
  - C Subtract 4 from both sides.
  - D Add 4 to both sides.

2. Which value of  $x$  satisfies the equation below?

$$4x - 7 = 25$$

- A  $x = -8$
  - B  $x = 4.5$
  - C  $x = 8$
  - D  $x = 32$
3. Tegan sells tickets for sports events. This month she earned commission of \$1,250, which is \$860 more than she earned last month. Which equation can be used to find last month's commission?
- A  $x + 1250 = 860$
  - B  $x - 860 = 1250$
  - C  $x + 860 = 1250$
  - D  $12x - 860 = 1250$

4. What is the solution to the inequality below?

$$2x + 10 \leq 40$$

- A  $x \leq 10$
  - B  $x \leq 15$
  - C  $x \geq 10$
  - D  $x \geq 15$
5. What is the solution to the equation below?

$$\frac{x}{-3} = 4$$

- A  $x = -7$
- B  $x = -12$
- C  $x = -1$
- D  $x = -\frac{4}{3}$

6. Which equation is not equivalent to  $x + 10 = 2x - 4$ ?

- A  $10 + 4 = x$
- B  $-x = 14$
- C  $x - 2x = -14$
- D  $x = 14$

7. Which of the following inequalities has the graphed solution below?



- A  $x + 1 \geq 0$
- B  $x - 1 \geq 0$
- C  $x + 1 \leq 0$
- D  $x - 1 \leq 0$

8. Which equation has  $x = -2$  as the solution?

- A  $2x + 10 = 14$
- B  $2x + 8 = 4$
- C  $3x + 10 = 1$
- D  $3x - 8 = 7$

9. Boris currently has \$1,200 in his savings account. He saves \$25 per month. He saves the same amount each month and does not take any money out of the account. In how many months will Boris have \$1,450?

- A 10
- B 12
- C 15
- D 25

10. Kayla tutors a student for \$18.50 per hour. She spends \$50 on transportation. How much does she earn if she tutors for  $x$  hours?

- A  $18.50x - 50$
- B  $18.50x + 50$
- C  $50x - 18.50$
- D  $50x + 18.50$

**UNIT**  
**3**

**Expressions, Equations, and Inequalities**

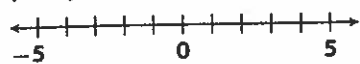
11. A technician charges an initial fee of \$300 plus an hourly fee of \$60. Mr. Jenks paid the technician \$480. How many hours did the technician work?

\_\_\_\_\_


12. What value of  $x$  satisfies  $3x + 2 = 14$ ?

\_\_\_\_\_

13. Draw a number line to represent the inequality  $x \leq -4$ .



14. Complete the inequality to represent the situation on the number line.



$\frac{x}{-4} \geq$  \_\_\_\_\_

15. Jana paid a \$75 initial fee to join a sports club and a monthly fee of \$15 per month. Write an expression that shows how much Jana spends after  $x$  months of membership at the sports club.

\_\_\_\_\_

16. Jack rented a boat for one day. It cost \$15.50 plus \$0.35 per hour. If Jack paid \$16.90 in total for the boat rental, for how many hours did he use the boat?

\_\_\_\_\_

17. Josh has scores of 16, 19, and 23 on three quizzes. What score must he get on the next quiz to have an average of at least 20?

\_\_\_\_\_

18. Sebby has \$330 for singing lessons. He paid \$20 for each lesson. How many lessons has he attended, if he still has \$210 left?

\_\_\_\_\_

19. Jasmine paid \$25 for two binders and one pack of pens. The pack of pens costs \$5. What is an equation you can use to find the price of each binder?

\_\_\_\_\_

20. Kenny wrote the equation for a linear relationship shown below.

$$y = -3x + 4$$

If  $x$  equals 7, what is the value of  $y$ ?

\_\_\_\_\_

21. Joey earns \$16 per hour as a telemarketer. He also earns a monthly bonus of \$400. Joey earned \$2,000 last month. How many hours did he work?

\_\_\_\_\_



**UNIT**  
**3****Expressions, Equations, and Inequalities****Performance Task**

Jessica's Cell Phone Plan

<b>Number of Text Messages</b>	50	75	100	125
<b>Cost (\$)</b>	35.00	35.75	36.50	37.25

1. Jessica's cell phone plan charges her a monthly fee plus a charge for each text message she sends. The cost of her cell phone is shown in the table above. How much does Jessica pay for each text message? Show your work.

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2. What is the monthly fee for Jessica's plan if she does not send any text messages? Show your work.

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3. What is an equation that shows the monthly fee,  $m$ , based on the number of text messages sent,  $t$ ?

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4. Jessica's bill last month was \$77.00. Use the equation you wrote in Exercise 3 to find the number of text messages Jessica sent last month. Show your work.

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5. Jessica wants to spend less than \$80.00 per month on her cell phone. Write and solve an inequality that shows how many text messages Jessica must limit herself to in order to keep her monthly bill less than \$80.00. Show your work.

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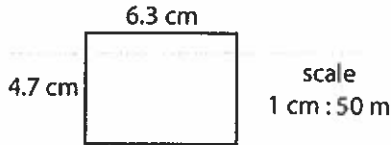
6. Jessica has the option to switch to a plan that charges \$65.00 per month with unlimited text messages. Jessica typically sends about 900 text messages per month. Does it make sense for her to switch to the new plan? Explain.

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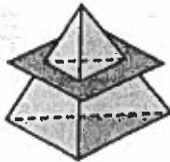
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**UNIT**  
**4** **Geometry**  
**Unit Test: A**

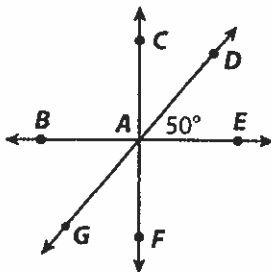
1. This scale drawing shows a parking lot. What is the length of the longer side of the actual lot?



- A 63 meters                      C 315 meters  
B 235 meters                     D 630 meters
2. Two sides of a triangle measure 10 cm and 15 cm. Which of the following is long enough to be the measure of the third side?
- A 1 cm                              C 4 cm  
B 3 cm                              D 6 cm
3. What is the shape of the cross section in the figure below?

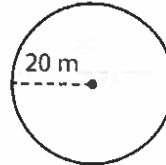


- A triangle                              C circle  
B square                                D rectangle
4. What is the measure of  $\angle GAB$ ?

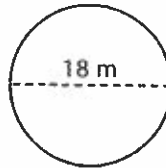


- A  $40^\circ$                                   C  $90^\circ$   
B  $50^\circ$                                   D  $130^\circ$

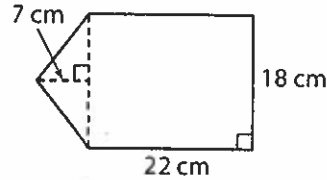
5. What is the circumference of the circle below?



- A 62.8 m                              C 345.7 m  
B 125.6 m                             D 725.5 m
6. What is the area of the circle below?

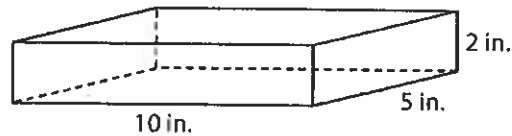


- A  $81 \text{ m}^2$                               C  $324 \text{ m}^2$   
B  $254.3 \text{ m}^2$                         D  $508.7 \text{ m}^2$
7. What is the area of the figure below?



- A  $154 \text{ cm}^2$                               C  $459 \text{ cm}^2$   
B  $396 \text{ cm}^2$                              D  $522 \text{ cm}^2$

Use the diagram for 8–9.



8. What is the surface area of the rectangular prism shown above?
- A  $100 \text{ in}^2$                               C  $200 \text{ in}^2$   
B  $160 \text{ in}^2$                              D  $220 \text{ in}^2$
9. What is the volume of the rectangular prism shown above?
- A  $100 \text{ in}^3$                               C  $150 \text{ in}^3$   
B  $120 \text{ in}^3$                              D  $200 \text{ in}^3$

**UNIT**  
**4**

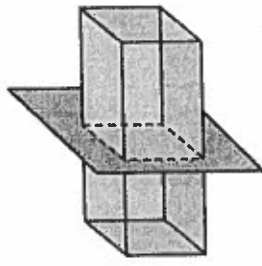
**Geometry**

10. A map scale is 1 in. : 50 mi. Two cities are 450 miles apart on the map. How far apart are the cities on the map?

\_\_\_\_\_

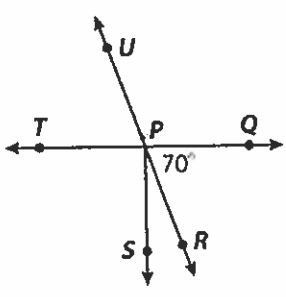
11. In the space below, draw a triangle with angles  $60^\circ$  and  $60^\circ$ , and an included side length of 1 inch.

12. Describe the cross section of the rectangular prism by naming its shape.



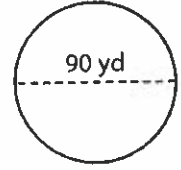
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13. What is the measure of  $\angle QPU$ ?



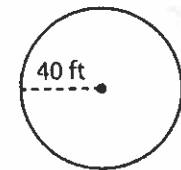
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14. What is the circumference of the circle below?



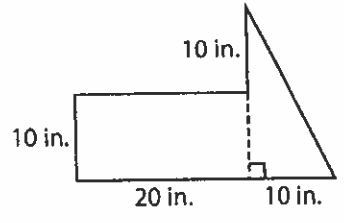
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15. What is the area of the circle below?



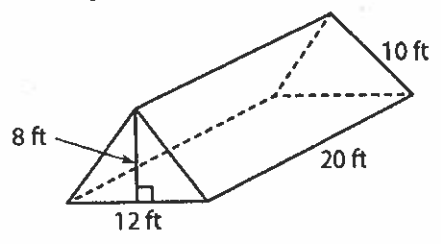
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16. What is the area of the figure below?



\_\_\_\_\_

Use the diagram for 17–18.



17. What is the surface area of the triangular prism shown above?

\_\_\_\_\_

18. What is the volume of the triangular prism shown above?

\_\_\_\_\_

**UNIT**  
**4**

# Geometry

## Performance Task

Answer the questions.

1. Alex is making a clock to give to his grandfather. To make the clock, he saws a slice of wood from a cylindrical log. What is the shape of the cross section of the log?

\_\_\_\_\_

2. Alex then paints the face of the clock with white paint. It has a diameter of 14 inches. What is the area of the clock face?

\_\_\_\_\_

3. Next, Alex glues a band of metal around the circumference of the clock. What is the length of the metal band?

\_\_\_\_\_

4. After installing the clock mechanism, Alex positions the hours hand and minutes hand on the clock to show 12:30. The seconds hand forms a  $60^\circ$  angle with the minutes hand. What is the angle between the seconds hand and the hours hand?

\_\_\_\_\_

5. Alex mounts the clock on a wood base with the shape shown at the right. What is the area of the wood base?

\_\_\_\_\_

6. Since the clock is a gift, Alex puts it in a box. The box is 22 inches  $\times$  4 inches  $\times$  20 inches. What is the volume of the box?

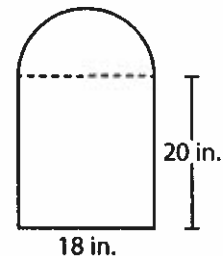
\_\_\_\_\_

7. Alex then wraps the box in wrapping paper. How much wrapping paper does Alex use, not including any overlap?

\_\_\_\_\_

8. Finally, Alex is ready to deliver the gift. On a map, it is 2.5 inches between Alex's town and his grandfather's town. The scale on the map is 1 in. : 12 miles. What is the actual distance between the towns?

\_\_\_\_\_



UNIT **Real Numbers and Scientific Notation**

**7**

1. Which fraction equals a repeating decimal?

- A  $\frac{5}{30}$                       C  $\frac{30}{50}$   
 B  $\frac{13}{25}$                       D  $\frac{13}{10}$

2. A square rug has an area of 225 square feet. How long is each side of the rug?

- A 15 feet  
 B 22.5 feet  
 C 23 feet  
 D 25 feet

3. Which statement is false?

- A All whole numbers are integers.  
 B All irrational numbers are real.  
 C Some integers are irrational.  
 D Some integers are whole numbers.

4. Which of these is least likely to describe a distance below sea level?

- A whole number  
 B integer  
 C rational number  
 D real number

5. Write  $4\frac{3}{8}$  as a decimal.

\_\_\_\_\_

6. Express the fraction  $\frac{5}{12}$  in decimal form.

\_\_\_\_\_

7. Choose three of the following terms for A, B, and C to make this diagram true: whole numbers, integers, rational numbers, irrational numbers, real numbers.

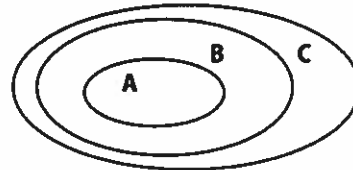


Diagram A: \_\_\_\_\_

Diagram B: \_\_\_\_\_

Diagram C: \_\_\_\_\_

Evaluate each expression.

1. $5.983 + 2.99$	2. $224 - 56.73$	3. $6.12 - 4.923$
4. $24.5 \cdot 3.2$	5. $0.23 \cdot 7$	6. $3.86 \cdot 9.15$
7. $14.8 \div 5$	8. $46.3 \div 1.5$	9. $147 \div 2.25$
10. $24.33 - 2.5 \cdot 7$	11. $3.9 + 4.5^2$	12. $9.25(18.4 - 2 \cdot 1.2)$

Solve each word problem, showing all work.

13. Jeff had \$46.18 in his wallet Monday morning. He gave half of his money to his brother. He then bought two donuts for \$0.75 each and a cup of coffee for \$2.99. How much money did Jeff have left?	14. Five friends split a \$65.20 bill at a restaurant. They also each left \$2.75 for the tip. How much money did each person pay in all?
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Evaluate each expression.

15. $\frac{4}{5} + \frac{3}{4}$	16. $4\frac{2}{7} + 2\frac{9}{14}$	17. $8\frac{11}{12} + 9\frac{5}{18}$
18. $6 - \frac{3}{8}$	19. $8\frac{3}{5} - 2\frac{1}{3}$	20. $4\frac{1}{6} - \frac{8}{9}$
21. $\frac{4}{25} \cdot \frac{15}{16}$	22. $2\frac{3}{4} \cdot 8$	23. $6\frac{5}{8} \cdot 3\frac{1}{2}$
24. $\frac{7}{9} \div \frac{2}{3}$	25. $\frac{4}{5} \div 10$	26. $5\frac{2}{3} \div 2\frac{5}{6}$

Solve each word problem, showing all work.

27. Jaimie ran $3\frac{1}{2}$ miles on Monday. She ran half as far on Tuesday as she did on Monday. How far did Jaimie run in all on Monday and Tuesday?	28. A $5\frac{1}{2}$ quart pot is filled $\frac{2}{3}$ of the way with water. How many more quarts of water can the pot hold?
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Write each ratio in 3 ways.

29. A bank contains 15 pennies and 12 nickels. Write the ratio of nickels to pennies.	30. A bowl contains 6 apples and some bananas. If there are a total of 10 pieces of fruit, find the ratio of apples to bananas.
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Convert each rate to a unit rate.

31. \$4.25 for 64 fluid ounces	32. 297 miles on 11 gallons of gas	33. 124 feet in 10 seconds
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Complete the chart by converting each number to a percent, fraction, and/or decimal.

	Fraction	Decimal	Percent
34.	$\frac{3}{8}$		
35.		0.45	
36.			72%
37.		0.1	
38.	$\frac{3}{200}$		

Find each percent of a number.

39. 30% of 90	40. 15% of 38	41. 50% of 86
42. 75% of 160	43. 24% of 35	44. 2% of 74



Compare the integers with  $<$ ,  $>$ , or  $=$ .

45. $-4 \bigcirc -5$	46. $2 \bigcirc -2$	47. $ -5  \bigcirc  5 $	48. $-7 \bigcirc 6$	49. $-13 \bigcirc -9$
50. $ -7  \bigcirc -6$	51. $-17 \bigcirc -14$	52. $ -3  \bigcirc  -2 $	53. $0 \bigcirc -6$	54. $ -4  \bigcirc  6 $

Graph and label each of the ordered pairs in the coordinate plane. Then state the quadrant or axis in/on which the point is located.

55. A(2, 4)	56. B(0, -3)	
57. C(1, -1)	58. D(3, 3)	
59. E(-4, 1)	60. F(2, 0)	
61. G(-3, -2)	62. H(-2, 3)	
63. I(0, 2)	64. J(-1, -4)	

Find the perimeter, area, and/or volume of the given figure.

<p>65. Find the perimeter &amp; area:</p>	<p>66. Find the perimeter &amp; area:</p>	<p>67. Find the perimeter &amp; area:</p>
<p>68. Find the perimeter &amp; area:</p>	<p>69. Find the area of a square with a perimeter of 45 cm</p>	<p>70. Find the volume:</p>

Evaluate each expression for  $a = 5$ ,  $b = 12$ ,  $c = 10$ , &  $d = 2$ .

71. $2b - a$	72. $d(ab - c)$	73. $3 + \frac{b}{d}$
74. $\frac{4a}{b + 4d}$	75. $2a^2 - c$	76. $b - c + d$

Solve each one-step equation.

77. $g + 3 = 17$	78. $r - 6 = 7$	79. $6b = 18$	80. $\frac{h}{q} = 3$
81. $5 = f - 8$	82. $48 = 12b$	83. $a + 24 = 83$	84. $17 + x = 23$
85. $10 = \frac{m}{5}$	86. $86.5 = f - 7.63$	87. $\frac{n}{6} = 11$	88. $\frac{3}{4}h = 12$

Solve each word problem using the method of your choice.

89. A fencing company charges \$22 per foot to install a wood fence. How much will it cost to install a wood fence around a rectangular pool area that is 20 feet wide and 38 feet long?

90. A 6 inch-tall plant grew  $\frac{3}{4}$  of an inch one week and twice as much the following week. How tall is the plant now?

91. Jack can read 45 pages of his book in one and a half hours. At that rate, how long will it take him to read the entire 300-page book?

92. Brian ordered 3 large cheese pizzas and a salad. The salad cost \$4.95. If he spent a total of \$47.60 including the \$5 tip, how much did each pizza cost? (Assume there is no tax).

93. A cookie recipe calls for  $3\frac{1}{4}$  cups of flour. The recipe makes 3 dozen cookies. How much flour is needed to make 144 cookies?

94. Ella has a box of chocolate candies. She gives  $\frac{1}{3}$  of the candies to her sister, 4 to her brother, and she eats the remaining 12 candies. How many chocolate candies were in the box originally?