



The Dominican

COMMUNITY *of* SCHOOLS

May, 2022

Dear Parents/Guardians,

The attached math enrichment packet is meant to provide your child with a review of material he/she learned in 7th grade. Your child is expected to turn the completed packet into Ms. Buntin (8th grade) on the first day of the 2022-2023 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.
- Show work (in an organized manner & # each problem) for ANY/ALL problems to receive full credit. This paper will be submitted with the completed packet.

Have a great summer!

Mrs. Jennie 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: 6.94×7.8

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

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: $25.3 \div 0.3$

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

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

$$\frac{13}{\cancel{3}6} \cdot \frac{\cancel{4}^2}{7} = \frac{26}{21} = \boxed{1\frac{5}{21}}$$

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

$$\begin{array}{r} 7 \\ \downarrow \\ \frac{7}{1} \div \frac{7}{4} \\ \downarrow \\ \frac{7}{1} \cdot \frac{4}{\cancel{7}} = \frac{4}{1} = \boxed{4} \end{array}$$

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.



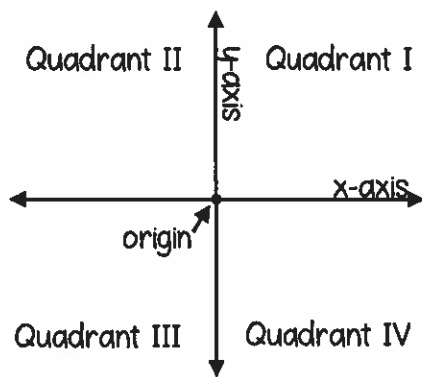
The absolute value of a number is the distance the number is from zero.

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

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

-7 < 9

The Coordinate Plane

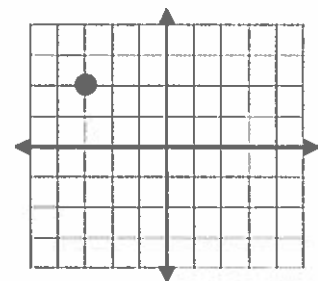


Ordered Pair: (x, y)

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:

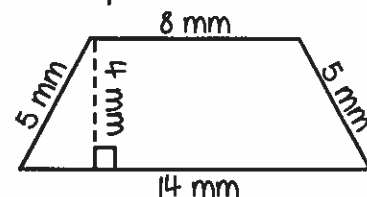
- Area of a Rectangle: $A = lw$

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

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.

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

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

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

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

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

One-Step Multiplication & Division Equations

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

$$\begin{array}{r} \text{ex: } 7b = 28 \\ \cancel{7} \quad \cancel{7} \\ \hline b = \boxed{4} \end{array}$$

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

$$\begin{array}{r} \text{ex: } 5 \cancel{\cdot} \frac{n}{5} = 10 \cdot 5 \\ \hline n = \boxed{50} \end{array}$$

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

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

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

$$\boxed{a = 21}$$

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

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

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

$$- 7x \quad - 7x$$

$$3x - 5 = -1$$

$$+ 5 \quad + 5$$

$$3x = 4$$

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

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

Slope & Rate of Change

Finding the Slope Given Two Points: Use the coordinates from the points in the slope formula:

$$\text{Slope } (m) = \frac{y_2 - y_1}{x_2 - x_1}$$

ex: $(4, -2), (-3, 8)$
 $x_1 \quad y_1 \quad x_2 \quad y_2$

$$m = \frac{8 - (-2)}{-3 - 4} = \frac{10}{-7} = \boxed{-\frac{10}{7}}$$

Finding the Rate of Change From a Table: Determine the amount the dependent variable (y) is changing and the amount the independent variable (x) is changing.

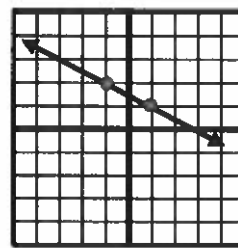
$$\text{Rate of Change} = \frac{\text{change in } y}{\text{change in } x}$$

ex:

		+2	+2	+2	
x	# months	3	5	7	9
y	Cost (\$)	80	130	180	230
		+50	+50	+50	

$$m = \frac{50}{2} = \boxed{25 \text{ dollars/month}}$$

Finding the Slope From a Graph: Choose 2 points on the graph. Find the vertical change (rise) and horizontal change (run) between the 2 points and write it as a fraction $\frac{\text{rise}}{\text{run}}$. (Up is positive, down is negative, right is positive, and left is negative).



rise = +1
run = -2

$$m = \frac{1}{-2} = \boxed{-\frac{1}{2}}$$

Graphing Linear Equations

Slope-Intercept Form: $y = mx + b$
 slope y-intercept

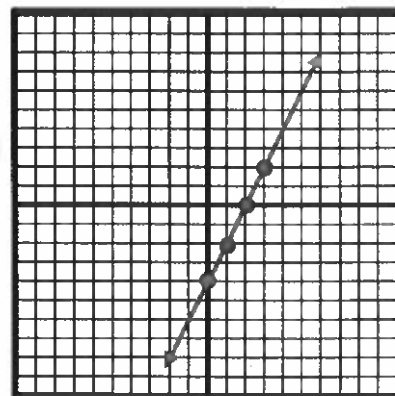
ex: $y = 2x - 4$

y-intercept: -4

slope: $2 = \frac{2}{1}$ ← rise
 ← run

How To Graph:

1. Make a point on the y-axis at the y-intercept.
2. Use the slope to determine where to make the next point. The numerator tells you the rise (how far up/down) and the denominator tells you the run (how far right/left) to make the next point.
3. Repeat to make more points and then connect the points with a line.



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

- What is the value of $-12 - (-35)$?
A -47 C 23
B -23 D 47
- Elijah spent \$5.25 for lunch every day for 5 school days. He spent \$6.75 on Saturday. How much did he spend in all?
A \$26.16
B \$31.25
C \$33.00
D \$60.00
- Briana played a trivia game in which she lost 5 points for each incorrect answer and gained 10 points for each correct answer. If Briana answered 11 questions correctly and 4 questions incorrectly, what was her total score?
A 15 C 80
B 70 D 90
- What is the product of $-1\frac{3}{8}$ and $2\frac{4}{5}$ expressed as a mixed number?
A $-3\frac{17}{20}$ C $-1\frac{17}{40}$
B $-\frac{55}{112}$ D $3\frac{17}{20}$
- Each year a store decreased the price of a certain model of TV by \$35. If the price in 2001 was \$1,950, what was the price in 2009?
A \$1,670 C \$1,880
B \$1,745 D \$1,915
- What is the value of $-3\frac{2}{3} + \frac{1}{3}$?
A -11 C $-1\frac{2}{9}$
B -5 D 11
- At Daria's school, $\frac{3}{8}$ of the students are left-handed. If there are 320 students, how many of them are left-handed?
A 37
B 60
C 120
D 160
- Benjamin had \$450 in his bank account on Monday. On Tuesday he wrote five checks for \$24.50 each. On Wednesday he made three deposits of \$45 each. How much money was in his account after the checks and deposits cleared?
A \$192.50 C \$462.50
B \$437.50 D \$707.50
- Jake's family is moving to a new home. They packed 22 boxes in $1\frac{5}{6}$ hours. What is the average number of boxes they packed per hour?
A 10 C 12
B 11 D 15
- On a certain day the temperature in Seattle was -1°C and the temperature in Houston was 18°C . How many degrees lower was the temperature in Seattle?
A 8° C 17°
B 9° D 19°
- What is the value of $-3 + 4.5 - (-1.2)$?
A -9.2 C 0.3
B -2.7 D 2.7
- Alyssa rode her bicycle 14.2 miles in 0.8 hours. What is the average number of miles she rode per hour?
A 11.36 C 17.75
B 15.0 D 22.2

UNIT
1

The Number System

13. A jug of orange juice contains 40.75 fluid ounces. It is shared equally among 5 people. How many ounces of orange juice does each person receive?

14. What is the value of $-\frac{7}{8} + -1\frac{2}{5}$?

15. There are 4,200 adults in Lakeview. Three-eighths of the adults in Lakeview do **not** have children. How many adults in Lakeview have children?

16. Calvin earned \$1,425 dollars by working five days in a week. He also received a bonus of \$200. What is the average amount that he earned per day?

17. Seth purchased a printer for \$350. The price of the printer that Jose purchased was $\frac{4}{5}$ the price that Seth paid. How much did Jose pay for his printer?

18. Timothy made 60 quarts of cider. He poured the cider into containers. Each container holds $\frac{4}{11}$ of a quart. How many containers did Timothy use?

19. Dori bought a sandwich for \$6.75, a bag of dried fruit for \$1.45 and a bottle of water for \$1.75. She paid the cashier with a \$20 bill. How much change did she receive?

20. What is the result when -2.5 is divided by 1.8 ?

21. Alex wants to purchase a set of 9 figurines that cost \$38 each. So far he has saved \$240 towards this purchase. How much more money does he need to save?

22. Kenneth shared a basket of apples with three of his friends. The basket weighed 14.75 pounds. What is the weight of the apples that each of the friends received?

23. A test has 40 questions. Denise finished $\frac{2}{5}$ of the questions in the first 10 minutes and $\frac{1}{2}$ of the remaining questions in the next 15 minutes. How many questions had Denise answered after 25 minutes?

24. George ate $\frac{2}{3}$ of a container of Chinese food. Silvia ate $\frac{1}{5}$ of the same container of Chinese food. What fraction of the container of Chinese food did they eat together?

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?

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

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?

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

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

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

UNIT
2

Ratios and Proportional Relationships

Unit Test: B

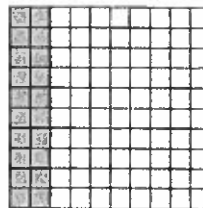
- A shopper bought a 12-pound bag of oranges for \$18.75. What was the unit price?
A \$0.64 C \$1.73
B \$1.56 D \$6.40
- The table shows a person saving money at a constant rate.

Weeks	2	4	6	8
Total Savings (\$)	60	120	180	240

How much will this person save in 70 days?

- A \$30 C \$140
B \$70 D \$300
- A student reads at a rate of 16 pages per day. Which ordered pair would be on a graph of this relationship?
A (1.5, 26) C (5.5, 88)
B (2.25, 30) D (7.25, 110)
 - Denise bought 5.2 pounds of rice for \$5.29. Using the unit rate, how much would 2 pounds of rice cost?
A \$1.02 C \$2.04
B \$1.29 D \$6.31
 - What is the percent of increase for a population that changed from 438,000 to 561,000?
A 21.9% C 35.6%
B 28.1% D 45.6%
 - A merchant buys a television for \$125 and sells it for a retail price of \$200. What is the markup?
A 37.5% C 62.5%
B 60% D 160%

- \$12,000 is invested for 4 years at a simple interest rate of 1.5%. How much does the investment earn?
A \$180 C \$1,800
B \$720 D \$7,200
- A dime is what percent of a dollar?
A 1% C 100%
B 10% D 1.10%
- When you find less 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 20 squares to 100 squares can be expressed in many ways. Which of the following is **not** a way to express the relationship?



- A $\frac{2}{10}$ C 0.02
B 20% D 0.2

UNIT
2

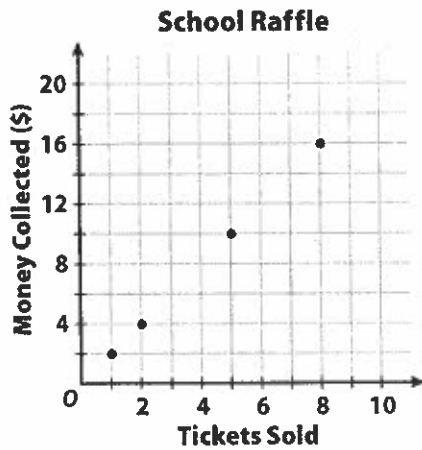
Ratios and Proportional Relationships

11. A machine stamps 360 metal parts in 15 minutes. Find the unit rate in parts per hour.

12. The table shows the distance traveled by an object moving at a constant speed. What is the constant of proportionality?

Seconds	10	15	20
Meters	85	127.5	170

13. Write an equation for the relationship shown on this graph if the price per ticket is doubled.



14. Compare the percents of change.

Year	2000	2005	2010
Population (millions)	4.3	3.2	5.6

15. A keyboard that costs \$475 is marked down 15% for a sale. What is the reduced price of the keyboard?

16. A shopper bought shoes marked \$45. The sales tax is 6.5%. How much did the shopper pay in all?

17. What can show a constant rate of change on a graph? Explain.

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

Number of Tickets	Cost (\$)
1	8
2	16
3	24
8	64

19. A store has a sale on pet supplies. The price, p , of each item is marked down 25%. The store also offers a coupon for \$5 off when you check out. Write an expression that represents the final price after a customer uses the coupon.

20. How would you show a rate of change of 15 feet per second on a graph? Name some of the points.

UNIT
2

Ratios and Proportional Relationships

Performance Task

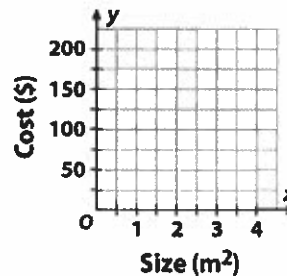
In the Doghouse

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.

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

Size (m²)	0.5	1	2.5	4
Cost (\$)				



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

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

Size (m²)	0.5	1	2.5	4
Cost (\$)				

- How will the graph change?

- Write an equation to show the new relationship.

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

Size (m²)	0.5	1	2.5	4
Cost (\$)				

- 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: B

1. Which is the first step in solving

$$x - \frac{1}{3} = \frac{1}{3} ?$$

- A Add $\frac{1}{3}$ to the left side.
 B Subtract $\frac{1}{3}$ from the left side.
 C Subtract $\frac{1}{3}$ from both sides.
 D Add $\frac{1}{3}$ to both sides.
2. Which value of x satisfies the equation below?

$$-2x - 7 = 12$$

- A $x = -9.5$ C $x = 9$
 B $x = -9$ D $x = 9.5$
3. Yoshiko is a real estate agent. This month she earned commission of \$5,750, which is \$2,480 more than she earned last month. Which equation can be used to find last month's commission?
- A $x + 5750 = 2480$
 B $x - 2480 = 5750$
 C $x + 2480 = 5750$
 D $12x - 2480 = 5750$
4. What is the solution to the inequality below?

$$4x - 3 \leq -5$$

- A $x \leq -0.5$ C $x \geq -0.5$
 B $x \leq 0.5$ D $x \geq 0.5$
5. What is the solution to the equation below?

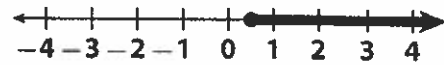
$$\frac{y}{-4} = 2$$

- A 2 C 8
 B -2 D -8

6. Which equation is not equivalent to

$$2x + 14 = 4x - 6 ?$$

- A $14 + 6 = 2x$
 B $-2x = 20$
 C $2x - 4x = -20$
 D $x = 10$
7. Which inequality has the graphed solution below?



- A $2x + 1 \geq 0$
 B $2x - 1 \geq 0$
 C $3x + 1 \leq 0$
 D $3x - 1 \leq 0$
8. Alessandro currently has \$2,400 in his savings account. He saves \$250 per month. Bea currently has \$1,750 in her account. She saves \$350 per month. How much more money than Alessandro will Bea have after 12 months?
- A \$100
 B \$450
 C \$550
 D \$650
9. Omar mows lawns for \$9.25 an hour. He spends \$7.50 on gas for the mower. How much does he make if he works h hours?
- A $h + 9.25$
 B $h + 7.50$
 C $9.25h + 7.50$
 D $9.25h - 7.50$

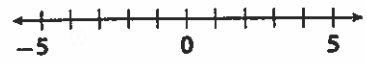
UNIT
3

Expressions, Equations, and Inequalities

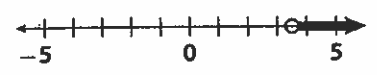
10. A computer repairman charges an initial fee of \$100 plus an hourly fee of \$75. Mr. Billings paid the repairman \$475. How many hours did the repairman work?

11. If $2a - 8 = 4$ and $3b - 8 = 10$, what is the value of $a + b$?

12. Draw a number line to represent the inequality $4 \geq x$.



13. Complete the inequality for the situation represented on the number line below.



$2x > \underline{\hspace{2cm}}$

14. Jessique sells handbags for \$50 each. She spends \$4 per handbag for materials and \$1,000 to rent a store each month. Write an expression that shows how much profit Jessique will earn in one month if she sells x handbags.

15. Jenya paid \$40 per month for a cell phone plus \$1.25 for each international text message she sent. She sent 50 international text messages in a month. What was Jenya's total cell phone bill?

16. Arlo rented a car. It cost \$29.99 plus \$0.26 per mile. If Arlo paid \$75.49 for the car rental, how many miles did he drive the car?

17. Evie has scores of 72, 78, 80, and 84 on four Science quizzes. What score must she get on the next quiz to have an average of at least 80?

18. Alissa has \$360 for guitar lessons. She pays \$25 for each lesson. How many lessons has she attended, if she still has \$85 left?

19. Cole paid \$24 for two calculators and one pack of pens. Kai paid \$45 for three calculators and two packs of pens. Cole and Kai both paid \$6 for each pack of pens. How much more did Kai pay for each calculator?

20. Jordana wrote the equation for a linear relationship as $y = -8x - 4$. For what value of x is y equal to -16 ?

21. Carmen earns a base salary of \$125,000, a commission of 4% of her total sales, and a performance bonus of \$25,000. If her total compensation last year was more than \$350,000, what was the least her total sales could be?

UNIT
3**Expressions, Equations, and Inequalities****Performance Task****Jessica's Cell Phone Plan**

Number of Text Messages	50	75	100	125
Cost (\$)	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.

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

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

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.

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.

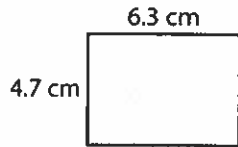
6. Jessica has the option to switch to a plan that charges \$65.00 per month with unlimited text messages. Jessica typically sends about 900 text messages per month. Does it make sense for her to switch to the new plan? Explain.

UNIT
4

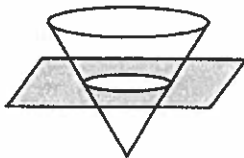
Geometry

Unit Test: B

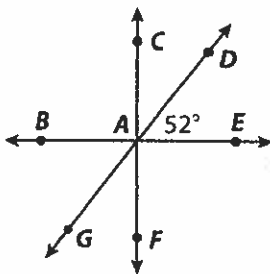
1. This scale drawing shows a parking lot with an actual length of 315 meters. What is the scale?



- A 1 cm: 10 m C 1 cm: 63 m
 B 1 cm: 50 m D 1 cm: 100 m
2. Two sides of a triangle measure 15 cm and 21 cm. Which of the following could be the measure of the third side?
- A 4 cm C 6 cm
 B 5 cm D 7 cm
3. The cone below is intersected by a horizontal plane. What is the shape of the cross section?

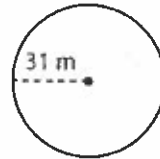


- A square C circle
 B triangle D oval
4. What is the measure of $\angle GAB$?

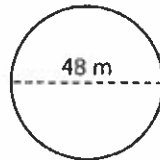


- A 38° C 89°
 B 52° D 128°

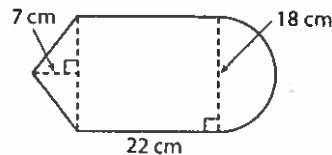
5. A circular fish pond is shown below. What is the circumference of the pond?



- A 97.3 m C 320.3 m
 B 194.7 m D 961.5 m
6. The figure below shows a circular driveway. What is the area of the driveway?

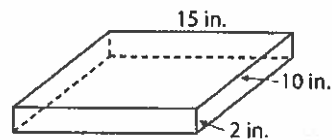


- A 150.7 m^2 C $1,808.6 \text{ m}^2$
 B 301.4 m^2 D $7,234.6 \text{ m}^2$
7. What is the area of the figure below? Use 3.14 for π .



- A 127.2 cm^2 C 586.2 cm^2
 B 396 cm^2 D 649 cm^2

Use the diagram for 8–9.



8. Malia is wrapping a gift in the box above. How much wrapping paper will she need, not including any overlap?
- A 300 in^2 C 400 in^2
 B 340 in^2 D 550 in^2
9. What is the volume of the gift box?
- A 300 in^3 C 400 in^3
 B 360 in^3 D 430 in^3

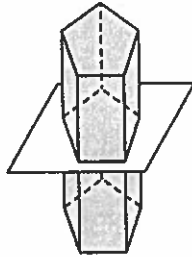
UNIT
4

Geometry

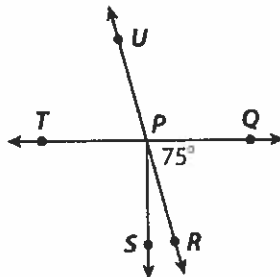
10. A map scale is 1 cm : 50 km. Two cities are 3.8 cm apart on the map. Find the actual distance between the two cities.

11. In the space below, draw a triangle with angles 35° and 75° , and an included side length of 1 inch.

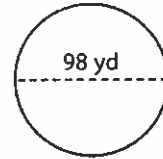
12. Describe the cross section of the pentagonal prism by naming its shape.



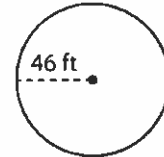
13. If $m\angle QPS = 90^\circ$, what is the measure of $\angle RPS$?



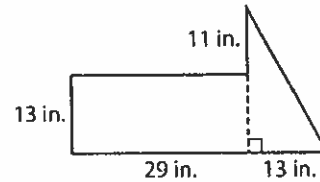
14. A horse trainer walks a horse around the circular track shown below. What is the circumference of the track?



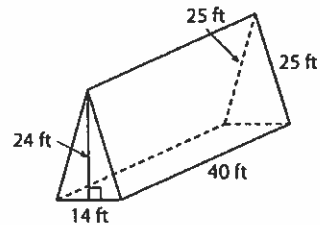
15. A landscaper mows a circle in a grass field. What is the area of the circle?



16. What is the area of the figure below?



Use the diagram for 17–18.



17. A circus tent has the dimensions shown above. What is the surface area of the tent, not including the floor?

18. What is the volume of the circus tent?

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?

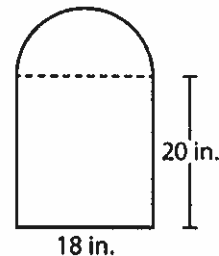
2. Alex then paints the face of the clock with white paint. It has a diameter of 14 inches. What is the area of the clock face?

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° 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
7 Notation

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 is an estimate of $\sqrt{14}$ to the nearest hundredth?

- A 1.4 C 3.47
 B 3.7 D 3.74

4. 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.

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

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

6. One type of ant is 0.0035 meter long. What is this length in scientific notation?

- A 3.5×10^{-4} meter
 B 3.5×10^{-3} meter
 C 35×10^{-3} meter
 D 35×10^{-5} meter

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

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

9. 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.

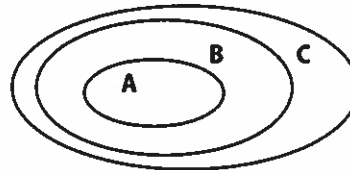


Diagram A: _____

Diagram B: _____

Diagram C: _____

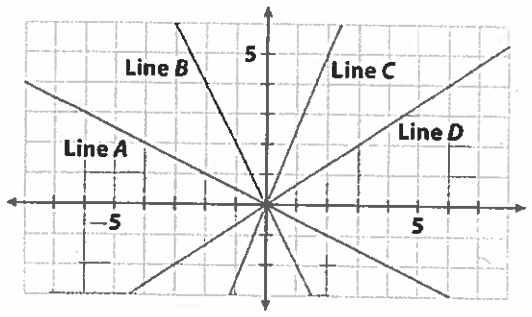
UNIT 8 **Linear Relationships and Equations**
Unit Test: B

1. Which equation shows the proportional relationship in the table?

Time (weeks)	2	5	10
Trees Planted	130	325	650

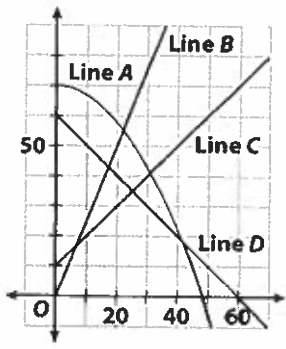
- A $y = 2x$ C $y = 130x$
 B $y = 65x$ D $y = 2x + 130$

2. Which line has a slope of $\frac{5}{2}$?



- A line A C line C
 B line B D line D

Use this graph for 3–4.



3. What is the equation for line D?
 A $y = 2.5x$ C $y = 10 - x$
 B $y = x + 10$ D $y = 60 - x$
4. Which graph shows a proportional relationship?
 A line A C line C
 B line B D line D

5. The costs for going to a dog beach are \$7 for 1 dog, and \$2 for each additional dog. Which equation shows this situation, where $x \geq 1$?

- A $y = 2x + 5$ C $y = 5x + 2$
 B $y = 3x + 11$ D $y = 7x + 11$

6. Jake and Hannah wash windows. Jake charges \$50 plus \$2 per window. Hannah charges \$20 plus \$5 per window. For how many windows washed do they charge the same amount?

- A 7 windows C 15 windows
 B 10 windows D 70 windows

7. A red car and a blue car are traveling at the same speed. The red car drives 3 hours. The blue car drives another half hour and goes 25 more miles. Which equation can be solved to find how fast the cars are going?

- A $3x + 25 = 3.5x$ C $2.5x + 25 = 3x$
 B $3x + 25 = 2.5x$ D $3.5x + 25 = 3x$

8. Anna and David left an 18% tip after having dinner at a restaurant. The amount of the tip was \$9. Anna's dinner cost \$28. Which equation can you use to find x , the cost of David's dinner?

- A $0.18(x + 28) = 9$ C $18(x + 28) = 9$
 B $0.18x + 28 = 9$ D $0.18x = 28 + 9$

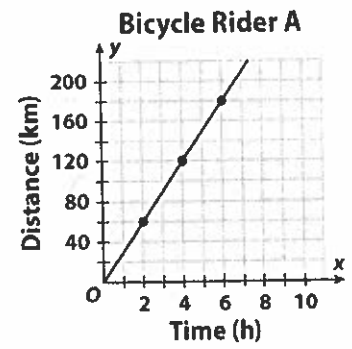
9. For the equation $3(7 + x) = 3x + k$, which value of k will create an equation with no solutions?

- A x C 15
 B $3x$ D 21

UNIT
8

Linear Relationships and Equations

10. This graph shows a bicyclist moving at a constant rate.



This table shows another bicyclist. How does the unit rate in the table compare with the unit rate on the graph?

Bicycle Rider B

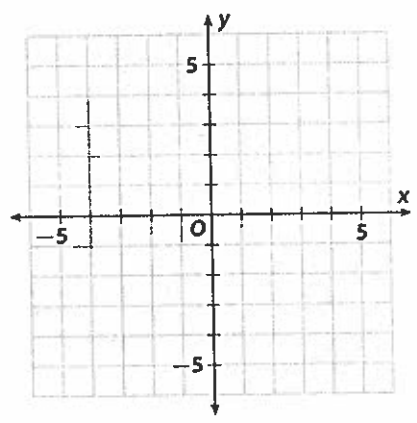
Time (h)	3	5	8
Distance (km)	72	120	192

11. Write equations for the two bicycle riders in problem 10. How far will each go in 9 hours?

Rider A: _____

Rider B: _____

12. Graph the equation $y = \frac{1}{2}x - 2$.



13. Find the slope and y-intercept of the graph in problem 12.

slope = _____

y-intercept = _____

14. A train leaves Buffalo traveling west at 60 miles per hour. An hour later, another train leaves Buffalo traveling east at 80 miles per hour. When are the two trains the same distance from Buffalo? Show the equation you use.

equation: _____

answer: _____

15. A red balloon starts at 7.3 meters off the ground and rises at 2.6 meters per second. A blue balloon starts at 12.4 meters off the ground and rises at 1.5 meters per second. Write and solve an equation to determine when the balloons are at the same height.

equation: _____

answer: _____

16. Nina saves 40% of her summer job earnings for college. This summer, she earned \$200 more than last summer, and she saved \$900. Write and solve an equation to find her earnings last summer.

equation: _____

solution: _____

17. Complete the equation so it has infinitely many solutions.

$3(2 + x) = 3x + \underline{\hspace{2cm}}$

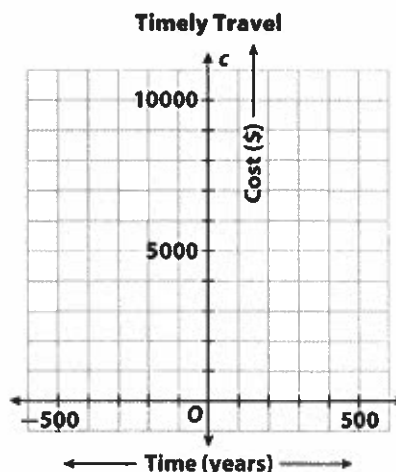
UNIT 8 **Linear Relationships and Equations**
Performance Task

Back to the Future

Although time travel often occurs in movies and books, it isn't possible in real life. But if it were possible, companies would probably exist to sell trips!

- Imagine that Timely Travel charges \$5 per year to go forward in time. Complete the table for this relationship. Draw the graph on the grid at the right.

Years (t)	200	400	500
Cost (c)			



- Write an equation for the graph. _____
- Timely Travel charges \$15 per year to go backward in time. Complete this table and draw the graph.

Years (t)	-200	-400	-500
Cost (c)			

- Write an equation for the graph. _____
- Compare the constants of proportionality. Why is one positive and one negative?

First and Last is a competing time-travel company. Here are their prices.

First and Last Time Travel

Years (t)	-500	-300	-100	100	300	500
Cost (c)	\$3,300	\$3,100	\$2,900	\$2,100	\$2,300	\$2,500

- Find the two equations, one for traveling forward to the future and one for traveling backward in time. Add the graphs to the grid above.
 forward ($t > 0$) _____ backward ($t < 0$) _____
- Compare the functions for Timely with those for First and Last. Which are linear? Which are proportional?

- When does Timely cost more than First and Last?

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.
---	---

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 & area:</p>	<p>66. Find the perimeter & area:</p>	<p>67. Find the perimeter & area:</p>
<p>68. Find the perimeter & 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. $\frac{h}{9} = 3$
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?

Solve each word problem using the method of your choice.

95. 20% of the 520 students in Wendover Middle School were involved in school sports. Of those students, 12.5% were on the wrestling team. How many students were on the wrestling team?

96. A piggy bank contains some dimes and nickels. There are 8 more dimes than nickels in the bank. There is a total of \$1.40. How many of each type of coin are in the bank?

97. An elevator in a tall building goes up 7 floors, then down 9 floors, down 4 floors, up 8 floors, and down 2 floors. Now it is on floor 14. On what floor did the elevator start?

98. Jenna danced for 3 hours on Sunday, 2 hours on Monday and Tuesday, 1 hour on Thursday, 1.5 hours on Friday, and 2 hours on Saturday. She did not dance at all on Wednesday. What is the average number of hours she danced each day? Round your answer to the nearest tenth of an hour.

99. Jackie makes \$15.25/hour babysitting. George makes \$18.50/hour mowing the lawn. If Jackie babysits for 4 hours and George mows lawns for 3 hours, who makes more money? How much more does he/she make?

100. A box of 8 crayons costs \$0.96. How much does each crayon cost? At that unit price, how much would a box of 30 crayons cost?

Evaluate each expression for $a = 9$, $b = -3$, $c = -2$, $d = 7$. Show your work.

1. $a - cd$	2. $2b^3 + c^2$	3. $\frac{a + d - c}{b}$	4. $(a - b)^2 + d(a + c)$
5. $4c - (b - a)$	6. $\frac{a}{b} - 5a$	7. $2bc + d(12 - 5)$	8. $b + 0.5[8 - (2c + a)]$

Simplify each expression using the Distributive Property.

9. $5(2g - 8)$	10. $7(y + 3)$	11. $-3(4w - 3)$	12. $(6r + 3)^2$
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Simplify each expression, showing all work.

13. $8(x + 1) - 12x$	14. $6w - 7 + 12w - 3z$	15. $9n - 8 + 3(2n - 11)$	16. $3(7x + 4y) - 2(2x + y)$
17. $(15 + 8d)(-5) - 24d + d$	18. $9(b - 1) - c + 3b + c$	19. $20f - 4(5f + 4) + 16$	20. $8(h - 4) - h - (h + 7)$

Solve each equation, showing all work.

21. $f - 64 = -23$

22. $-7 = 2d$

23. $\frac{b}{-12} = -6$

24. $13 = m + 21$

25. $5x - 3 = -28$

26. $\frac{w + 8}{-3} = -9$

27. $-8 + \frac{h}{4} = 13$

28. $22 = 6y + 7$

29. $8x - 4 = 3x + 1$

30. $-2(5d - 8) = 20$

31. $7r + 21 = 49r$

32. $-9g - 3 = -3(3g + 2)$

33. $5(3x - 2) = 5(4x + 1)$

34. $3d - 4 + d = 8d - (-12)$

35. $f - 6 = -2f + 3(f - 2)$

36. $-2(y - 1) = 4y - (y + 2)$

Find the slope of the line that passes through the points. Show your work.

61. $(-5, 3), (2, 1)$

62. $(8, 4), (11, 6)$

63. $(9, 3), (9, -1)$

64. $(-4, -2), (-6, 4)$

Find the rate of change. Show your work.

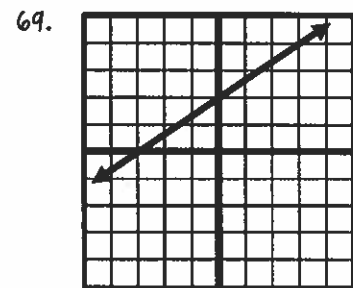
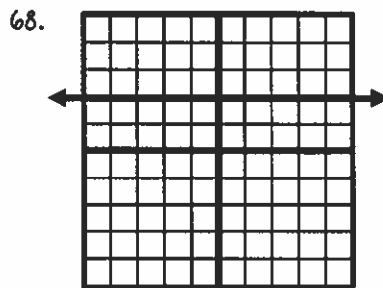
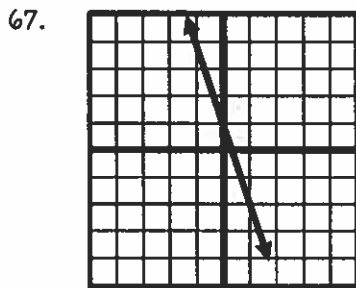
65.

Number of Hours	3	6	9	12
Distance (in miles)	135	270	405	540

66.

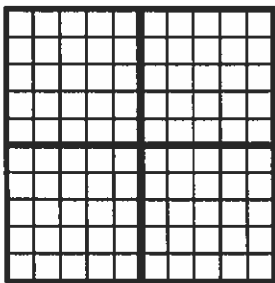
Number of Weeks	1	3	5	7
Pounds	173	169	165	161

Find the slope of the line.

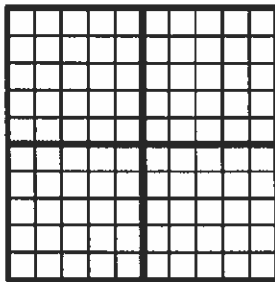


Graph the line.

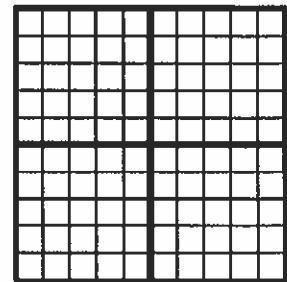
70. $y = -x - 3$



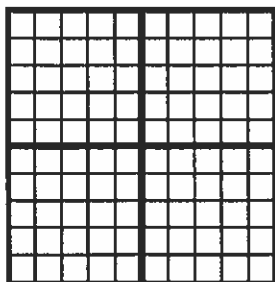
71. $y = \frac{1}{3}x + 2$



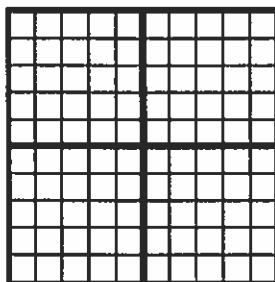
72. $y = -3x - 1$



73. $y = -\frac{3}{2}x - 2$



74. $y = 2x + 1$



75. $y = \frac{1}{4}x$

