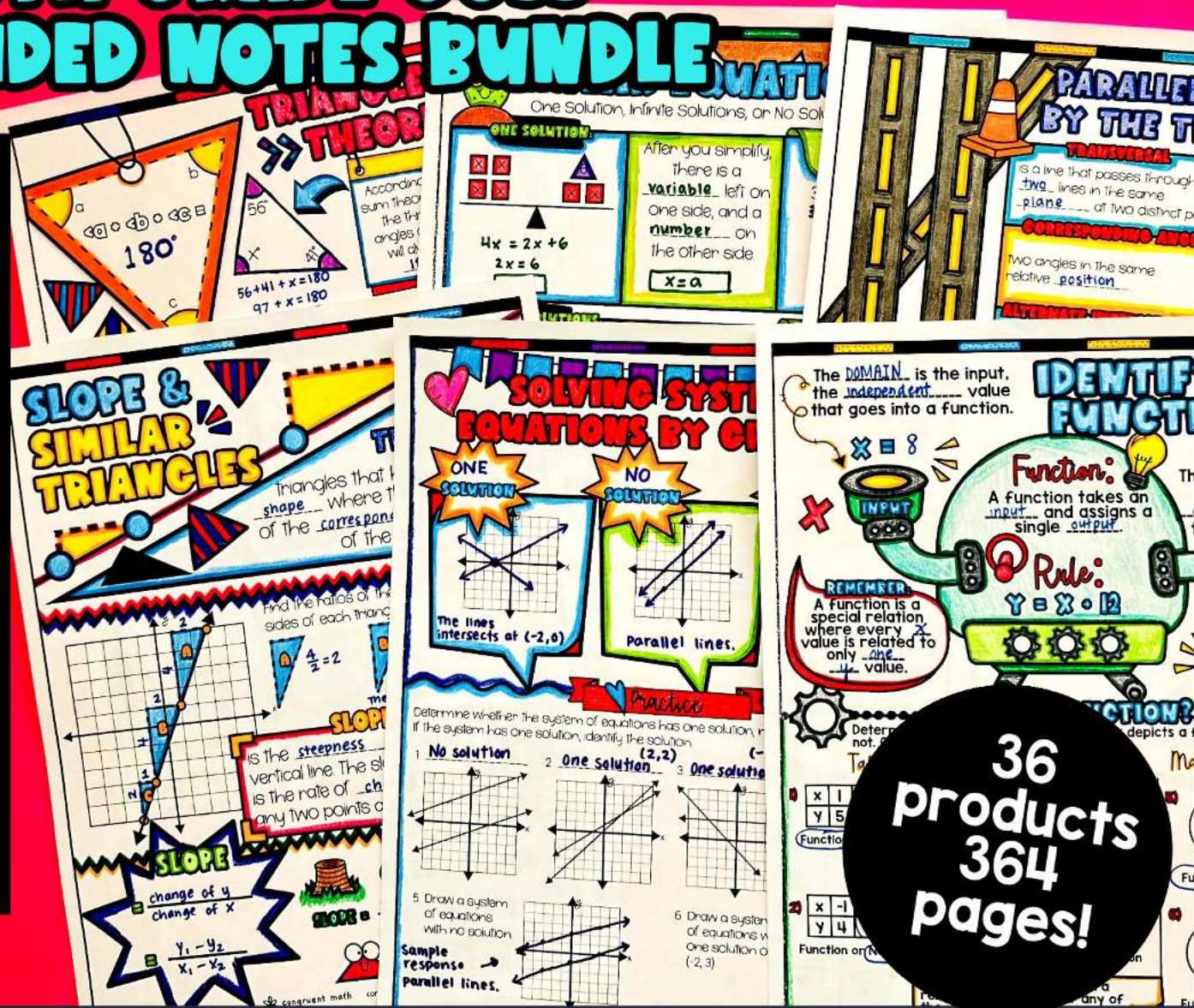


8TH GRADE CCSS - UNIT BUNDLE

8TH GRADE CCSS GUIDED NOTES BUNDLE

Guided Notes Units

1. Real Numbers
2. Scientific Notation and Laws of Exponents
3. Linear Equations & System of Equations
4. Functions
5. Transformations
6. Pythagorean Theorem, Angles, and Volume
7. Statistics



36 products
364 pages!

Fun and engaging notes!

PRACTICE

Classify each number below as rational or irrational. Justify your answer.

a) -0.5
Rational number because it's a terminating decimal.

b) π
Irrational because it's a non-terminating decimal.

c) $4\sqrt{4}$
Rational number because it's a repeating decimal.

d) -2
Rational because it's an integer.

e) 5π
Irrational

f) $3\frac{7}{8}$
Rational

RATIONAL VS. IRRATIONAL NUMBERS

RATIONAL NUMBERS

Can be written as $\frac{a}{b}$ where $a, b = \text{integers}$ and $b \neq 0$

INCLUDES...

- integers: $5, -1, \sqrt{4}$ (square root of perfect squares)
- decimals (terminating or repeating): $0.7, 0.\bar{3}$
- fractions: $\frac{2}{5}$

IRRATIONAL NUMBERS

Any numbers that cannot be turned into a fraction

INCLUDES...

- $\sqrt{2}$ (non-terminating or non-repeating decimals)
- π (square roots of non-perfect squares)
- $\sqrt{37}$

YOU TRY!

Classify each number below as rational or irrational. Then, write the numbers into the correct corresponding box.

$-12, \frac{1}{4}, \pi, 40, \sqrt{16}, \frac{-2}{3}, \sqrt{2.5}, \sqrt{3}, 88, \frac{5}{7}, \sqrt{52}, 0.\bar{6}$

RATIONAL NUMBERS	IRRATIONAL NUMBERS
-12	π
$\frac{1}{4}$	$\sqrt{52}$
$\frac{-2}{3}$	$\sqrt{2.5}$
40	$\sqrt{3}$
88	
$\frac{5}{7}$	
$0.\bar{6}$	

THEN, FILL IN ANY REMAINING SPACES WITH YOUR DESIRED COLORS.

3. Which of the following numbers is a rational number?
 -12 or 12π

4. Which of the following numbers is a rational number?
 $\frac{2}{3}$ or $\frac{\sqrt{2}}{3}$

7. Which of the following numbers is a rational number?
 $\sqrt{10}, 7,$ or $\sqrt{19}$

8. Which of the following numbers is a rational number?
 -17.6 or $\frac{8}{0}$

11. Which of the following numbers is a rational number?
 $\sqrt{20}$ or $\sqrt{36}$

12. Which of the following numbers is a rational number?
 $-\sqrt{5}$ or $\sqrt{25}$

Every set of guided notes includes sketch notes, practice, and real-life applications.

PERFECT CUBES

What is a perfect cube?
A number expressed as a product of an integer multiplied by itself three times.

EXAMPLES:
 $1^3 = 1$
 $2^3 = 8$
 $3^3 = 27$
 $4^3 = 64$
 $5^3 = 125$
 $6^3 = 216$
 $7^3 = 343$
 $8^3 = 512$

This means cubed $2 \cdot 2 \cdot 2 = 8$

$3^3 = 27$ is a perfect cube because it forms a cube with volume of 27 and with side lengths of 3 by 3 by 3

64 is a perfect cube because it forms a cube with volume of 64 and with side lengths of 4 by 4 by 4

CUBE ROOT

Cubes and cube roots are opposites to each other in nature.
Perfect cubes are numbers with integers as their cube roots.
A cube root of a number is a value that is multiplied by itself 3 times to give the original number.

EQUATIONS WITH CUBES & CUBE ROOTS
Solve for x .

a) $\sqrt[3]{x^3} = \sqrt[3]{216}$
 $x = 6$

b) $\sqrt[3]{x^3} = \sqrt[3]{729}$
 $x = 9$

c) $\sqrt[3]{x^3} = \sqrt[3]{1000}$

REAL-LIFE APPLICATION

As an engineer, you're tasked with designing a cube-shaped water tank with a desired volume of 1000 cubic feet. To determine the required side lengths of the cube, you calculate the cube root of the volume:
 $\sqrt[3]{1000} = 10$ feet.

This means each side of the cube-shaped water tank should be 10 feet long. You can also represent this situation with $x^3 = 1000$. In this equation, x represents the side length of the cube.

The use of cube roots is essential for designing structures where volume is a key factor. Engineers and designers use cube roots to align with functional requirements.

In your own words, explain how perfect cubes or cube roots can be used in real life.
Cubes and cube roots are useful in volume calculation of cube-shaped containers.

CHECKING IN
Color in the emoji that best represents how you're currently feeling about this topic.

Explain why...
Student responses may differ based on their confidence in this topic.

Practice

$\sqrt[3]{512} - \sqrt[3]{64} = 4$
 $8 - 4 = 4$

$7^3 + 3^3 = 343 + 27 = 370$

TO COLOR THE PICTURE ABOVE, THEN FILL IN ANY REMAINING SPACES WITH YOUR DESIRED COLORS

Variety of practice activities incorporated!

COLOR BY CODE

Color by Number

MAZE:

Solve the problems below to escape the maze.

START: Given the following translation rule, write the ordered pair of A'.
 Rule $(x, y) \rightarrow (x + 5, y - 3)$
 $A(1, -8) \rightarrow A'(6, -11)$

Given the translation rule, write the ordered pair of B'.
 Rule $(x, y) \rightarrow (x + 4, y)$
 $N(-9, 4) \rightarrow N'(-5, 4)$

Given the following translation rule, write the ordered pair of N'.
 Rule $(x, y) \rightarrow (x - 9, y + 7)$
 $N(-4, -5) \rightarrow N'(-13, 2)$

Maze

PRACTICE

Graph and label the image of the figure after the transformation.

- Rule $(x, y) \rightarrow (x-8, y+2)$
- Rule $(x, y) \rightarrow (x+2, y-4)$
- Rule $(x, y) \rightarrow (x+6, y-4)$

Use the arrow notation to write a rule to describe the transformation.

- Rule $(x, y) \rightarrow (x+1, y-8)$
- Rule $(x, y) \rightarrow (x-7, y+4)$

4. Rule $(x, y) \rightarrow (x+3, y-2)$

Pre-image	Image
A (-3, 4)	A' (0, 2)
B (-5, 4)	B' (-2, 2)

5. Rule $(x, y) \rightarrow (x+2, y+1)$

Pre-image	Image
A (4, 3)	A' (6, 4)

6. Rule $(x, y) \rightarrow (x-4, y+4)$

Colorful and visual notes!

SLOPE & SIMILAR TRIANGLES

triangles that have the same shape where the ratios of the corresponding lengths of the sides are equal

Find the ratios of the vertical to the horizontal sides of each triangle. What do you notice?

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

The ratios are all the same.

SLOPE

is the steepness of a non-vertical line. The slope of a line is the rate of change between any two points along that line.

SLOPE

= $\frac{\text{change of } y}{\text{change of } x}$

$$= \frac{y_1 - y_2}{x_1 - x_2}$$

x_1, y_1, x_2, y_2
 $(5, 2), (17, -8)$
SLOPE = $\frac{2 - (-8)}{5 - 17} \rightarrow \frac{10}{-12} = \boxed{-\frac{5}{6}}$

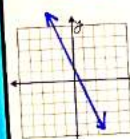
MAKE SURE TO SIMPLIFY THE FRACTIONS!

4 TYPES OF SLOPE

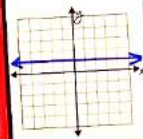
POSITIVE SLOPE



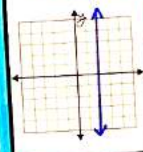
NEGATIVE SLOPE



ZERO SLOPE

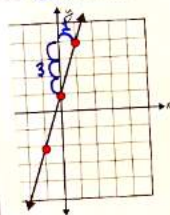


UNDEFINED SLOPE

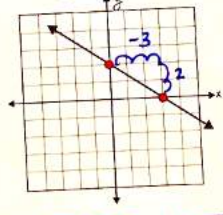


FIND THE SLOPE OF THE LINES BELOW:

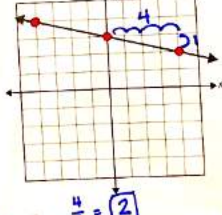
1. $\frac{3}{1} = 3$



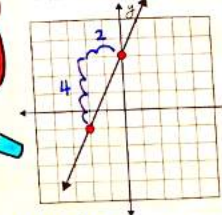
2. $-\frac{3}{2}$



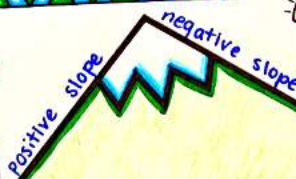
3. $\frac{1}{4}$



4. $\frac{4}{2} = 2$



Slope is also known as the rate of change between two points on a line.



SLOPE FROM TWO POINTS

1. The slope of the line passing through the points below:
 a) (1, 2) and (3, 4)
 b) (-10, 2) and (9, -2)
 c) (8, 2) and (22, -4)

3. $\frac{2 - (-2)}{-10 - 9} = \frac{4}{-19}$

$\frac{2 - (-4)}{8 - 22} = \frac{6}{-14} = \boxed{-\frac{3}{7}}$

APPLICATION

1. Do the points A(1, 2), B(5, 14), and C(10, 29) lie on the same line? How do you know?

Slope of AB: $\frac{14 - 2}{5 - 1} = \frac{12}{4} = 3$

Slope of BC: $\frac{29 - 14}{10 - 5} = \frac{15}{5} = 3$

The points lie on the same line because slope of AB = slope of BC.

THE LINE

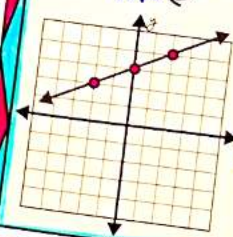
origin

passes the y-axis at b

$$y = mx + b$$

slope

y-intercept



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

$b = 3$

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

SLOPE & SIMILAR TRIANGLES

Triangles that have the same shape where the ratios of the corresponding lengths of the sides are equal.

Find the ratios of the vertical to the horizontal sides of each triangle. What do you notice?

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

The ratios are all the same.

SLOPE

is the steepness of a non-vertical line. The slope of a line is the rate of change between any two points along that line.

SLOPE = $\frac{\text{change of } y}{\text{change of } x}$

$\text{SLOPE} = \frac{y_2 - y_1}{x_2 - x_1}$

$\text{SLOPE} = \frac{2 - (-8)}{5 - 17} = \frac{10}{-12} = -\frac{5}{6}$

Guided Notes
3 pages

4 TYPES OF SLOPE

POSITIVE SLOPE

NEGATIVE SLOPE

ZERO SLOPE

UNDEFINED SLOPE

Slope is also known as the rate of change between two points on a line.

negative slope

FROM TWO POINTS

Line passing through the points below:

a) $(-10, 2)$ and $(2, -2)$
 $\frac{2 - (-2)}{-10 - 9} = \frac{4}{-19}$

b) $(8, 2)$ and $(22, -4)$
 $\frac{2 - (-4)}{8 - 22} = \frac{6}{-14} = -\frac{3}{7}$

APPLICATION

TIP! One way to check if two points lie on the same line is by getting between two pairs of the resulting points. If the points are the same, then we can say three points are on the same line.

Do the points A(1, 2), B(5, 14), and C(10, 29) lie on the same line? How do you know?

Slope of AB: $\frac{14 - 2}{5 - 1} = \frac{12}{4} = 3$

Slope of BC: $\frac{29 - 14}{10 - 5} = \frac{15}{5} = 3$

The points lie on the same line because slope of AB = slope of BC.

LINE

passes the y-axis at b.

$y = mx + b$

slope $m = \frac{1}{2}$

y-intercept $b = 3$

COLOR BY CODE

Solve the problems to color the picture above. Then color with your desired colors.

1 Find the slope of the line passing through $(0, -7)$ and $(10, -9)$. $-\frac{1}{5}$

2 Find the slope of the line passing through $(-3, -2)$ and $(1, 1)$. $\frac{3}{4}$

3 Find the slope of the line passing through $(-3, 5)$ and $(4, -9)$. $-\frac{14}{7}$

4 Find the slope of the line passing through $(-3, 5)$ and $(4, -9)$. $-\frac{14}{7}$

5 Find the slope of the line passing through $(-3, 5)$ and $(4, -9)$. $-\frac{14}{7}$

6 Find the slope of the line passing through $(-3, 5)$ and $(4, -9)$. $-\frac{14}{7}$

7 Find the slope of the line passing through $(-3, 5)$ and $(4, -9)$. $-\frac{14}{7}$

8 Find the slope of the line passing through $(-3, 5)$ and $(4, -9)$. $-\frac{14}{7}$

Practice
2 pages

REAL-LIFE APPLICATION!

Real-life applications, including environmental science. Ecologists track the numbers of plants, animals, and ecosystems to assess growth rates, which are helpful for examining environmental factors on...

Rate of change is helpful for tracking the rates of temperature change in different climates, and guide policy for coastal retreat, aiding in the...

Real-Life Uses
1 page

PARALLEL LINES CUT BY THE TRANSVERSAL

TRANSVERSAL
is a line that passes through two lines in the same plane at two distinct points.

CORRESPONDING ANGLES
Two angles in the same relative position. They are congruent.

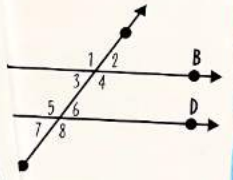
ALTERNATE INTERIOR ANGLES
are formed on the inside of the two parallel lines on opposite sides of the transversal. They are congruent.

ALTERNATE EXTERIOR ANGLES
are formed on the outside of the two parallel lines on opposite sides of the transversal. They are congruent.

SUPPLEMENTARY ANGLES
Two or more angles whose sum is 180 degrees.

PRACTICE

Types of Angles



- Identify the types of angle pairs described below.
- 1 < 1 and < 5 corresponding
 - 2 < 3 and < 6 alternate interior
 - 3 < 1 and < 8 alternate exterior
 - 4 < 3 and < 5 consecutive interior
 - 5 < 1 and < 4 vertical
 - 6 < 4 and < 8 corresponding
 - 7 < 2 and < 7 alternate exterior
 - 8 < 6 and < 7 vertical
 - 1 < 4 and < 6 consecutive interior

REAL LIFE APPLICATION

In city planning, angles from parallel lines and transversals are key to efficient, accessible urban designs. The grid pattern, prevalent in many cities, utilizes this geometry with parallel streets intersected by transversals, enhancing navigation, traffic flow, and connectivity. These intersections also impact the placement of public spaces, parks, and buildings, with careful angle consideration ensuring well-lit areas, managed pedestrian flow, and optimized views, thus improving residents' quality of life.

Modern transportation systems depend on parallel lines and transversals for safe, efficient operation. Parallel tracks support multiple trains' movement, and transversals allow for crossings and switches. This geometry is vital for complex network organization, particularly at junctions and stations. Engineers are precisely calculated to reduce derailment risks and smooth transitions, enabling fast, safe train journeys. These geometric principles are fundamental to railway functionality and reliability, highlighting their role in contemporary transportation.

Give a real life application of finding parallel lines cut by transversals? Please explain in your own words.

Which best shows how you feel about this topic? Explain why.

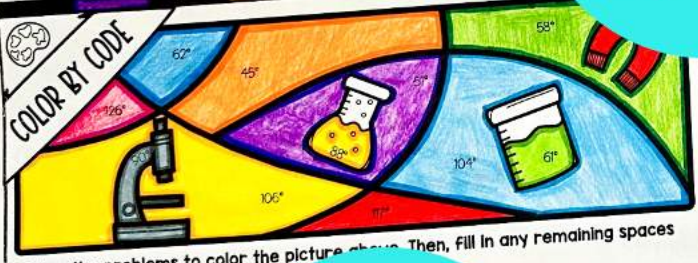


Guided Notes
2 pages

What are parallel lines?

Parallel lines are straight lines that lie on the same plane and never meet each other.

COLOR BY CODE



Solve the problems to color the picture above. Then, fill in any remaining spaces with your desired colors.

1)	2)
3)	4)
5)	6)
7)	8)
9)	10)

Practice
2 pages

THE MAZE

Solve the problems to escape the maze. Highlight or shade in the path.

START! Identify the pairs of angles shown here.

Identify the pairs of angles shown here. (consecutive interior)

Identify the pairs of angles shown here. (alternate interior)

Identify the pairs of angles shown here. (vertical)

Identify the pairs of angles shown here. (alternate exterior)

Identify the pairs of angles shown here. (consecutive interior)

Identify the pairs of angles shown here. (alternate interior)

Identify the pairs of angles shown here. (vertical)

Identify the pairs of angles shown here. (consecutive interior)

Identify the pairs of angles shown here. (alternate interior)

Identify the pairs of angles shown here. (vertical)

Real-Life Uses
1 page

Rigid Transformations: Translations

Preview Sample

PRACTICE

Graph and label the image of the figure after the translation.

1. Rule $(x, y) \rightarrow (x-8, y+2)$

2. Rule $(x, y) \rightarrow (x+2, y-4)$

3. Rule $(x, y) \rightarrow (x+1, y-8)$

4. Rule $(x, y) \rightarrow (x+3, y-2)$

5. Rule $(x, y) \rightarrow (x+7, y+2)$

Pre-image	Image
A (-3, 4)	A' (0, 2)
B (-5, 4)	B' (-2, 2)
C (-6, 2)	C' (-3, 0)

TRANSLATION

A translation is a transformation that moves every point of the figure the same distance, in the same direction, without any change in size or orientation.

ARROW NOTATION

Pre-image $P(x, y)$ → Image $P(x = a, y = b)$

move "a" units horizontally.
move "b" units vertically

Move right	Move left	Move up	Move down
a is positive	a is negative	b is positive	b is negative

EXAMPLE:

Translate the figure 5 units right and 3 units down. Graph & label the image.

Arrow notation for this rule:
Rule $(x, y) \rightarrow (x+5, y-3)$

Pre-image: Write the ordered pairs.
Image: Write the ordered pairs.

$A(-3, 4) \rightarrow A'(2, 1)$
 $B(-6, 4) \rightarrow B'(-1, 1)$
 $C(-6, 2) \rightarrow C'(-1, -1)$

1. Write the arrow notation for this transformation.
Rule $(x, y) \rightarrow (x+7, y-1)$

2. Write the arrow notation for this transformation.
Rule $(x, y) \rightarrow (x-8, y)$

THEN, FILL IN ANY REMAINING SPACES WITH YOUR DESIRED COLORS.

3. Use the arrow notation to write a rule to describe the translation.
 $K(10, -7) \rightarrow K'(14, -8)$
Rule $(x, y) \rightarrow (x+4, y-1)$

4. Use the arrow notation to write a rule to describe the translation.
 $C(15, 14) \rightarrow C'(16, 12)$
Rule $(x, y) \rightarrow (x+1, y-2)$

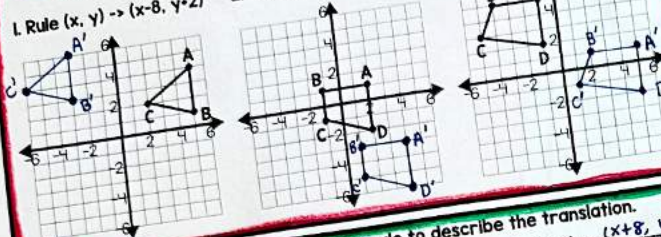
7. Use the arrow notation to write a rule to describe the translation.
 $V(-8, 7) \rightarrow V'(-1, 8)$
Rule $(x, y) \rightarrow (x+7, y+1)$

8. Use the arrow notation to write a rule to describe the translation.
 $F(9, 12) \rightarrow F'(17, 9)$
Rule $(x, y) \rightarrow (x+8, y-3)$

12. Use the arrow notation to write a rule to describe the translation.
 $Z(-2, -9) \rightarrow Z'(-1, -9)$

PRACTICE

Graph and label the image of the figure after the transformation.



Use the arrow notation to write a rule to describe the translation.

1. Rule $(x, y) \rightarrow (x+1, y-8)$

2. Rule $(x, y) \rightarrow (x-7, y+2)$

3. Rule $(x, y) \rightarrow (x+8, y)$

4. Rule $(x, y) \rightarrow (x+4, y-2)$

Pre-image

A (-3, 4)

B (-5, 4)

C (-5, 1)

TRANSLATION

A translation is a transformation that moves every point of the figure the same distance in the same direction, without any change in size or orientation.

ARROW NOTATION

Pre-image $P(x, y)$ → Image $P(x+a, y+b)$

move "a" units horizontally
move "b" units vertically

Move right	Move left	Move up	Move down
a is positive	a is negative	b is positive	b is negative

EXAMPLE:

Translate the figure 5 units right and 3 units down. Graph & label the image.

Arrow notation for this rule:

Rule $(x, y) \rightarrow (x+5, y-3)$

Guided Notes
2 pages

Given the following translation rule, write the ordered pair of R:

Rule $(x, y) \rightarrow (x, y - 9)$

$R(3, -8) \rightarrow R'(3, -17)$

Given the following translation rule, write the ordered pair of D:

Rule $(x, y) \rightarrow (x - 7, y - 1)$

$D(10, -9) \rightarrow D'(-3, -10)$

Given the following translation rule, write the ordered pair of N:

Rule $(x, y) \rightarrow (x + 4, y - 1)$

$N(10, -7) \rightarrow N'(14, -8)$

Real-Life Uses
1 page

REAL LIFE APPLICATION

Translations for tasks like autonomous navigation in factories, hospitals, and even outdoor environments. The distance and direction they need to move to reach a destination, which may be programmed or determined by sensors and environmental data. Through a combination of these technologies, robots can perform translations that allow them to navigate city streets and perform tasks.

Translations are incredibly useful in many industries and are equipped with precise sensors that are repetitive, precise, and reliable. This skill to avoid obstacles, additionally, autonomous navigation can help gate city streets and perform tasks.

Use the arrow notation to write a rule to describe the translation.

$K(10, -7) \rightarrow K'(14, -8)$

Rule $(x, y) \rightarrow (x+4, y-1)$

Use the arrow notation to write a rule to describe the translation.

$C(15, 14) \rightarrow C'(16, 12)$

Rule $(x, y) \rightarrow (x+1, y-2)$



Multi-Step Equations

Preview Sample

ONE-STEP EQUATION

Variable on One Side

COMBINING LIKE TERMS

$$\begin{aligned} -14 \cdot 9x - 2x &= -42 \\ -14x + 7x &= -42 \\ +x &+14 \end{aligned}$$

$$\frac{7x}{7} = \frac{-28}{7}$$

check

$$\begin{aligned} -14 + 9(-4) - 2(-4) &= -42 \\ -14 - 36 + 8 &= -42 \\ -42 &= -42 \end{aligned}$$

DISTRIBUTIVE PROPERTY

$$\begin{aligned} 5(-2x + 3) &= 45 \\ -10x + 15 &= 45 \\ -15 &-15 \\ -10x &= 30 \\ -10 &-10 \\ x &= -3 \end{aligned}$$

check

$$\begin{aligned} 5(-2(-3) + 3) &= 45 \\ 5(6 + 3) &= 45 \\ 5(9) &= 45 \\ 45 &= 45 \end{aligned}$$

MULTI-STEP EQUATIONS

Variable on Both Sides

HOW TO SOLVE

Some equations have variables on both sides of the equal sign.

Steps to Solve:

1. Simplify each side of the equation by using the distributive property or combining like terms.
2. Use inverse operations to get the variables all to one side of the equal sign.
3. Then, use inverse operations to solve for the variable.
4. Check using substitution.

EXAMPLE:

$$\begin{aligned} 10 - 7x + 7 &= 11x + 1 - 2x \\ -7x + 17 &= 9x + 1 \\ +7x &+7x \\ \hline 17 &= 16x + 1 \\ -1 &-1 \\ \hline 16 &= 16x \end{aligned}$$

check

$$\begin{aligned} 10 - 7(1) + 7 &= 11(1) + 1 - 2(1) \\ 10 - 7 + 7 &= 11 + 1 - 2 \\ 10 &= 12 - 2 \\ 10 &= 10 \end{aligned}$$

YOU TRY!

$$\begin{aligned} 5x - 14 &= 2(4x + 2) \\ 5x - 14 &= 8x + 4 \\ -5x &-5x \\ -14 &= 3x + 4 \\ -4 &-4 \\ -18 &= 3x \\ -3 &-3 \\ x &= -6 \end{aligned}$$

$$\begin{aligned} 13x + 2 + 2x &= 11 + 12x \\ 15x + 2 &= 11 + 12x \\ -12x &-12x \\ 3x + 2 &= 11 \\ -2 &-2 \\ 3x &= 9 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 6x + 5 &= 10 + 5x \\ -5x &-5x \\ x + 5 &= 10 \\ -5 &-5 \\ x &= 5 \end{aligned}$$

Identify & Evaluate Functions

Preview Sample

IS THIS A FUNCTION?

GRAPHS
The vertical line test is a tool for determining whether or not the graph of a relation represents a function.

Vertical Line Test

Step 1: Move a vertical line across a graph (like a pen)
Step 2: Count the intersections.
If the vertical line intersects the graph once only, it's a function.
If the vertical line intersects the graph more than once, it's not a function.

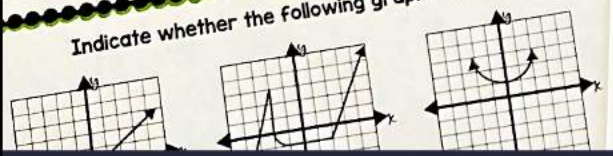
EXAMPLE 2:



This is not a function because the vertical line intersects the graph multiple times.

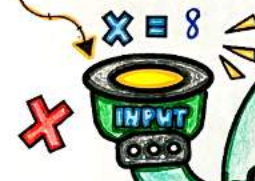
YOU TRY

Indicate whether the following graphs represent a function.



The DOMAIN is the input, the independent value that goes into a function.

IDENTIFYING FUNCTIONS



Function:
A function takes an input and assigns a single output.

The RANGE is the output, the dependent value that comes out.

REMEMBER:
A function is a special relation where every x value is related to only one y value.

Rule:
 $Y = X + 12$

IS IT A FUNCTION?

Determine whether each of the following depicts a function or not. Circle an option.

Table

x	1	4	5	-7	-1
y	5	8	8	-2	6

Function or Not a Function

2)

x	-1	2	4	2	8
y	4	9	7	5	-12

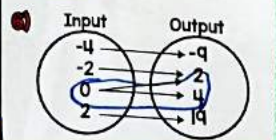
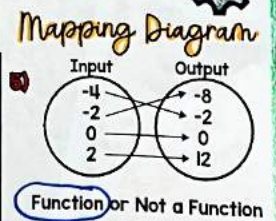
Function or Not a Function

Set Notation
3) $(-4, -5), (0, 8), (-4, 2)$

Function or Not a Function

4) $(7, 0), (2, 9), (-3, 4)$

Function or Not a Function



To identify a function from a relation, check to see if any of

EVALUATING FUNCTIONS

Evaluating a function means to substitute a variable with a number or expression.

Example 1:
Find the output, y, when the input, x, is 45.
 $6 + \frac{r}{15}$
 $+ \frac{45}{15}$
 $+ 3$

Example 2:
Find the output, y, when the input, x, is -12.
 $y = x^2 - 39$
 $y = (-12)^2 - 39$
 $y = 144 - 39$
 $y = 105$

Example 3:
Find the output, g, when the input, k, is 12.
 $g = 8k - 15$
 $g = 8(12) - 15$
 $g = 96 - 15$
 $g = 81$

PRACTICE

For each set of relations represents a function. Write yes or not and explain why.

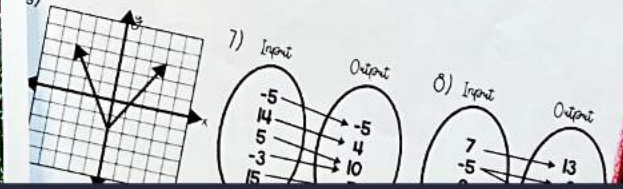
2)

x	-1	0	1	2
y	-2	0	2	4

Yes, every input has only one output.

3) Set Notation: $(-3, -6), (0, 5), (-3, 2)$
No, -3 has two different outputs.

4) Set Notation: $(-1, 4), (3, 7), (2, 1)$
Yes, every input has only one output.




Volume of 3D Figures

Preview Sample

NAME: _____

VOLUME OF 3D FIGURES

CYLINDERS



$$V = \pi r^2 h$$

r = radius $\pi \approx 3.14$
 h = height


EXAMPLE
FIND THE VOLUME OF THE CYLINDER.
RADIUS = 3
HEIGHT = 5

$$V = \pi r^2 h$$

$$V = (3.14)(3^2)(5)$$

$$V = 141.3 \text{ unit}^3$$

CONES



$$V = \frac{1}{3} \pi r^2 h$$

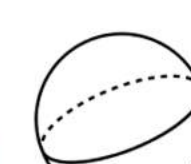
EXAMPLE
FIND THE VOLUME OF THE CONE.
RADIUS = 5
HEIGHT = 8

$$V = \frac{1}{3} \pi r^2 h$$

$$V = \frac{1}{3} (3.14)(5^2)(8)$$

$$V = 209.33 \text{ unit}^3$$

SPHERES



$$V = \frac{4}{3} \pi r^3$$

EXAMPLE
FIND THE VOLUME OF THE SPHERE.
RADIUS = 3

$$V = \frac{4}{3} \pi r^3$$


$$V = \frac{4}{3} (3.14)(3^3)$$

$$V = 113.04 \text{ unit}^3$$

NAME: [Key]

VOLUME OF 3D FIGURES

CYLINDERS



$$V = \pi r^2 h$$

r = radius $\pi \approx 3.14$
 h = height


EXAMPLE
FIND THE VOLUME OF THE CYLINDER.
RADIUS = 3
HEIGHT = 5

$$V = \pi r^2 h$$

$$V = 3.14(3^2)(5)$$

$$V = 141.3 \text{ unit}^3$$

CONES



$$V = \frac{1}{3} \pi r^2 h$$


EXAMPLE
FIND THE VOLUME OF THE CONE.
RADIUS = 5
HEIGHT = 8

$$V = \frac{1}{3} \pi r^2 h$$

$$V = \frac{1}{3} (3.14)(5^2)(8)$$

$$V = 209.33 \text{ unit}^3$$

SPHERES



$$V = \frac{4}{3} \pi r^3$$

EXAMPLE
FIND THE VOLUME OF THE SPHERE.
RADIUS = 3

$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{4}{3} (3.14)(3^3)$$

$$V = 113.04 \text{ unit}^3$$

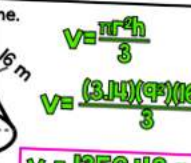
* congruent math congruentmath.com

Name: [Key] Date: _____

VOLUME PRACTICE

Volume. Use 3.14 for π and round your answers to the nearest hundredths.

1. Find the volume.
16 m

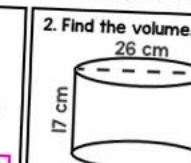


$$V = \pi r^2 h$$

$$V = \frac{(3.14)(9^2)(16)}{3}$$

$$V = 1356.48 \text{ m}^3$$

2. Find the volume.
26 cm

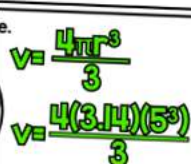


$$V = \pi r^2 h$$

$$V = (3.14)(13^2)(17)$$

$$V = 9021.22 \text{ cm}^3$$

3. Find the volume.
16 m




$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{4(3.14)(5^3)}{3}$$

$$V = 523.33 \text{ m}^3$$

4. Find the volume.
9.4 cm

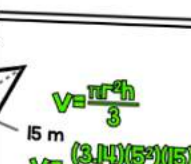


$$V = \pi r^2 h$$

$$V = (3.14)(4^2)(9.4)$$

$$V = 472.26 \text{ cm}^3$$

5. Find the volume.
15 m




$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{(3.14)(5^3)(15)}{3}$$

$$V = 392.5 \text{ m}^3$$

6. Find the volume.
18 m



$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{4(3.14)(9^3)}{3}$$

$$V = 3052.08 \text{ m}^3$$

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- Heather P.



"Loved it! Used it for students' interactive notebooks"

· Desiree L.



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- Carissa S.



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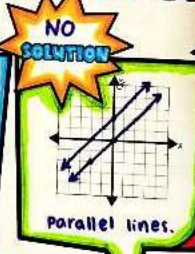
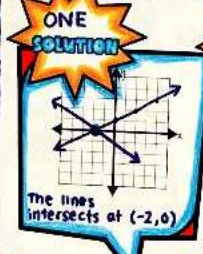
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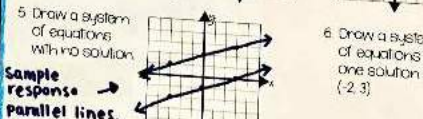
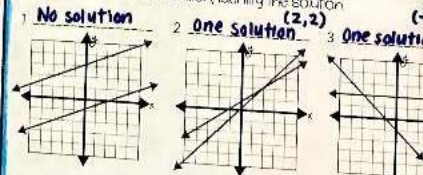
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SOLVING SYSTEMS OF EQUATIONS BY GRAPHING



Determine whether the system of equations has one solution, no solution, or infinitely many solutions. If the system has one solution, identify the solution.



IDENTIFY A FUNCTION

The **DOMAIN** is the input, the **independent** value that goes into a function.

Function: A function takes an **input** and assigns a single **output**.

Rule: $Y = X \cdot 12$

REMEMBER: A function is a special relation where every x value is related to only one y value.

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