SEP 2016 VERSION

1.1 Evaluate Expressions

Goal • Evaluate algebraic expressions and use exponents.

Your Notes

An algebraic expression is also called a variable expression.

VOCABULARY

Variable is a LETTER (X, Y, A, B...) THAT REPRESENTS A NUMBER.

Algebraic $\boxed{\text{expression}}$ is a COLLECTION OF NUMBERS, VARIABLES, OPERATIONS (+, −, ×, ÷) AND SYMBOLS OF INCLUSION ( ), [ ], { }

Evaluating an expression means to find the value of the expression

"EVALUATE EXPRESSIONS"

"SOLVE EQUATIONS"

Power

Base

Exponent

FACTORS: NUMBERS OR VARIABLES MULTIPLIED TOGETHER

FACTORS ARE SEPERATED BY MULT. SIGNS

EXPONENT

X^2

BASE

power

expand

$\underbrace{X \cdot X}_{\text{2 FACTORS}}$

ALGEBRAIC EXPRESSIONS

Algebraic Expression	Meaning	Operation
7t ← implied mult	7 times *t*	MULTIPLY
$\frac{x}{20}$	FRACTIONS MEAN →	Division
$y - 8$	→	subtraction
$12 + a$	→	addition

Your Notes

To evaluate an expression, substitute a number for the variable, perform the operation(s), and simplify.

Example 1 *Evaluate algebraic expressions*

Evaluate the expression when $n = 4$.

a. $11 \cdot n = 11 \times$ 4   Substitute 4 for n.

$11n =$ 44   ← EVALUATE

Given Expression

DO NOT USE X FOR MULTIPLICATION

HW

Checkpoint Evaluate the expression when $y = 8$.

Write the problem →

Show substitution →

EVALUATE →

1. $7y$	2. $y \div 2$	3. $10 - y$	4. $y + 6$
$7(8)$	$8 \div 2$	$10 - 8$	$8 + 6$
56	4	2	14

Example 2 *Read and write powers*

Write the power in words and as a product. ← did NOT SAY EVALUATE!

Power	Words	Product of factors
a. 12^1	twelve to the first power	$12 \Leftrightarrow 12^1$
b. 2^3	~~two to the third power~~, or two cubed	EXPAND AS A PRODUCT → $2 \cdot 2 \cdot 2$
c. $\left(\frac{1}{4}\right)^2$	one fourth to the second power, or one fourth squared	$\frac{1}{4} \cdot \frac{1}{4}$
d. a^4	a to the 4TH power	$a \cdot a \cdot a \cdot a$

Your Notes

Checkpoint Write the power in words and as a product.

WORDS →

product (expand) →

Evaluate!! →

(to find the value of the expression)

5. 2^5	6. $\left(\frac{1}{3}\right)^2$	7. $(10)^3$
2 to the 5TH	1/3 SQUARED	10 CUBED
$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	$\frac{1}{3} \cdot \frac{1}{3} =$	$10 \cdot 10 \cdot 10 =$
32	$\frac{1}{9}$	1,000

Example 3 *Evaluate powers*

Evaluate the expression.

a. y^3 when $y = 3$

USE ( )'s when substituting to do order of operations Correctly

Solution

a. $y^3 = (3)^3$ Substitute 3 for y.

$= 3 \cdot 3 \cdot 3$ ← mentally expand

$= 27$ EVALUATE means find the VALUE of the expression

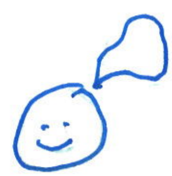
Checkpoint Evaluate the expression.

8. t^2 when $t = 3$	9. m^5 when $m = \frac{1}{2}$
$(3)^2 =$	$\left(\frac{1}{2}\right)^5$
9	$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$
	$\frac{1}{32}$

Show substitution

← mentally expand

← Circle answer



Homework

1.2 Apply Order of Operations

Goal • Use the order of operations to evaluate expressions.

Your Notes

WARNING

Be careful using PEMDAS

ORDER OF OPERATIONS

① ( )'s IN → OUT
② EXPONENTS
③ ×, ÷ L → R
④ +, − L → R

To evaluate an expression involving more than one operation, use the following steps.

Step 1 Evaluate expressions inside GROUPING SYMBOLS

Step 2 Evaluate POWERS

Step 3 MULTIPLY and divide from left to right.

Step 4 Add and SUBTRACT from left to right.

Example 1 *Evaluate Expressions*

Evaluate the expression $30 \cdot 2 \div 2^2 - 5$. =

EVALUATE:

$30 \cdot 2 \div 4 - 5 =$

$60 \div 4 - 5 =$

$15 - 5 =$

10

Show work clearly + GO DOWN NOT ACROSS!

Your Notes

Checkpoint Evaluate the expression.

1. $10 + 3^2 =$ $10 + 9 =$ 19	2. $16 - 2^3 + 4 =$ $16 - 8 + 4 =$ $8 + 4 =$ 12
3. $28 \div 2^2 + 1 =$ $28 \div 4 + 1 =$ $7 + 1 = 8$	4. $4 \cdot 5^2 + 4$ $4 \cdot 25 + 4$ $100 + 4 =$ 104

Example 2 *Evaluate expressions with grouping symbols*

Evaluate the expression.

a. $6(9 + 3) = 6(12) =$

$= 72$

b. $50 - (3^2 + 1) = 50 - (9 + 1) =$

$50 - 10 =$

$= 40$

c. $3[5 + (5^2 + 5)] = 3[5 + (25 + 5)] =$

$3[5 + 30] =$

$3(35) =$

$= 105$

Grouping symbols such as parentheses ( ) and brackets [ ] indicate that operations inside the grouping symbols should be performed first.

START WITH THE INSIDE ( )'S AND WORK OUT

Your Notes

Checkpoint Evaluate the expression.

5. $6(3 + 3^2)$ $6(3+9) =$ $6(12) =$ 72 Work down	6. $2[(10 - 4) \div 3]$ $2(6 \div 3) =$ $2(2) =$ 4

Example 3 *Evaluate an algebraic expression*

Evaluate the expression $\frac{12k}{3(k^2 + 4)}$ when $\boxed{k = 2.}$

A fraction bar can act as a grouping symbol. Evaluate the numerator and denominator before dividing.

Solution

$$\frac{12k}{3(k^2 + 4)} = \frac{12(2)}{3[(2)^2+4]}$$

STEP I

Substitute 2 **for** k. Use ( ) for substitions

STEP II EVALUATE EXPRESSION

$$\frac{12(2)}{3[4+4]}$$

EVALUATE **power.**

FRACTIONS

= (1) simplify the numerator $12 \cdot 2 = 24$
(2) simplify the denominator $3[4+4] = 24$ Domentally

$$= \frac{24}{24}$$

$$= \boxed{1}$$

Simplify the fraction!!

Checkpoint Evaluate the expression when $x = 3$.

Homework

7. $x^3 - 5$ $(3)^3 - 5 =$ $27 - 5 =$ 22	8. $\frac{6x + 2}{x + 7}$ $\frac{6(3)+2}{3+7} =$ $\frac{20}{10} = 2$

1.3 Write Expressions

Goal • Translate verbal phrases into expressions.

Your Notes

VOCABULARY

Verbal model (used in this textbook) Use words to describe the problem. This should be a mental step.

Rate IS A FRACTION THAT COMPARES 2 QUANTITIES MEASURED IN DIFFERENT UNITS

EXAMPLE

Rate = $\frac{400 \text{ miles}}{8 \text{ hours}}$

Unit rate IS A RATE PER 1 GIVEN UNIT IN THE DENOMINATOR

UNIT RATE

Ex] simplify above rate: $\boxed{50 \text{ miles/hour}}$

TRANSLATING VERBAL PHRASES

Operation	Verbal Phrase	Expression
Addition	The sum of 3 and a number *n*	$3+n$
	A number *x* plus 10	$x+10$
Subtraction	The difference of 7 and a number "a".	$7-a$
	Twelve less than a number *x*	$x-12$
Multiplication	Five times a number *y*	$5y$
	The product of 2 and a number *n*	$2N$
Division	The QUOTIENT of a number *a* and 6	$\frac{a}{6}$
	Eight divided into a number *y*	$\cancel{8/y}$ $\boxed{y/8}$

order makes a difference

Order matters

Order is important when writing subtraction and division expressions.

QUANTITY means ( )'s

IS means EQUAL

OF means MULTIPLY

Your Notes

Example 1 *Translate verbal phrases into expressions*

ONLY USE ( )'s IF NEEDED!!!

Translate the verbal phrase into an expression.

The words "the quantity" tell you what to group when translating verbal phrases.

Verbal Phrase	Expression
a. 6 less than the quantity 8 times a number x	$8x - 6$
b. 2 times the sum of 5 and a number a	$2(5+a)$
c. The difference of 17 and the cube of a number n	$17 - n^3$

Checkpoint Translate the verbal phrase into an expression.

1. The product of 5 and the quantity 12 plus a number n

$5(12+n)$

2. The quotient of 10 and the quantity a number x minus 3

$\frac{10}{x-3}$ OR $10/(x-3)$

Be careful

$\cancel{10/x-3}$ wrong

Example 2 *Use a verbal model to write an expression*

KEY INFORMATION

4 people collect the same # of cans

Food Drive You and three friends are collecting canned food for a food drive. You each collect the same number of cans. Write an expression for the total number of cans collected.

Solution

Step 1 mentally think of a verbal model: Amount of cans × Number of People

DEFINE VARIABLE

C = # of cans

DO NOT FORGET UNITS

Step 2 Translate the verbal model into an algebraic expression. $C \cdot 4$

An expression that represents the total number of cans is $4C$.

DAY 2

Your Notes

Checkpoint Complete the following exercise.

Key INFO
Example 2
PLUS Divide into
2 Food Banks

3. In Example 2, suppose that the total number of cans collected are distributed equally to 2 food banks. Write an expression that represents the number of cans each food bank receives.

Total # of cans → $\frac{4C}{2}$ ← 2 FOOD BANKS

$\frac{4C}{2} \xrightarrow{\text{simplify}} \boxed{2C}$

Example 3 *Find a unit rate*

Three gallons of milk cost $9.15. Find the unit rate.

Solution

① write as a rate

② divide to find the unit rate

$\frac{\boxed{\$9.15}}{\boxed{3}\text{ gallons}} = \frac{\$3.05}{1\text{ GALLON}}$

Scratch Paper

$9.15 \div 3 = 3.05$

The unit rate is $3.05 per gallon, or $3.05/GAL

answers

Checkpoint Find the unit rate.

RATES

4. $\frac{420\text{ miles}}{3\text{ hours}}$ =	5. $\frac{\$\cancel{12}\ 4}{\cancel{3}\ 1\text{ ft}^2}$	6. $\frac{20\text{ cups}}{8\text{ people}}$
		$\frac{20}{8} = \frac{10}{4} = \frac{5}{2}$
140miles/hr	$4/ft²	2.5cups/person

UNIT RATES

OR

2 ½ cups/person

Homework

$420 \div 3 = 140$

1.4 Write Equations and Inequalities

Goal • Translate verbal sentences into equations or inequalities.

Your Notes

IMPORTANT DEFINITION!

"SOLVE EQUATIONS AND INEQUALITIES"

VOCABULARY

Open sentence ARE EQUATIONS AND INEQUALITIES

Equation 2 EXPRESSIONS CONNECTED WITH AN EQUAL SIGN

Inequality 2 EXPRESSIONS CONNECTED WITH $>, \geq, <, \leq, \neq$

Solution of an equation IS THE NUMBER(s) THAT MAKE THE EQUATION TRUE

Solution of an inequality IS THE SET OF ALL NUMBERS THAT MAKE THE INEQUALITY TRUE

EXPRESSING OPEN SENTENCES

Symbol	Meaning
$a = b$	a is EQUAL to b
$a < b$	a is less than b
$a \leq b$	a is less than or EQUAL TO b
$a > b$	a is Greater than b
$a \geq b$	a is greater than or EQUAL TO b

$a \neq b$ a is NOT EQUAL TO B

EXAMPLE

① $x < 5$

"5 is NOT A SOLUTION"

② $x \leq 5$

"5 IS a solution"

ONLY USE ( )'s IF NEEDED!

Your Notes

Example 1 *Write equations and inequalities*

Write an equation or an inequality.

Verbal Sentence	Equation or Inequality
a. The sum of three times a number a and 4 is 25.	$3a+4=25$
b. The quotient of a number x and 4 is fewer than 10.	$\frac{x}{4}<10$
c. A number n is greater than 6 and less than 12.	$6<n<12$ OR $\boxed{n>6 \text{ AND } n<12}$

Sometimes two inequalities are combined. For example, the inequalities $a < b$ and $b < c$ can be combined to form the inequality $a < b < c$.

Example 2 *Check possible solutions*

Check whether 2 is a solution of the equation or inequality.

Equation or Inequality	Substitute	Conclusion
a. $7x - 8 = 9$	$7(2) - 8 \stackrel{?}{=} 9$ $6 \neq 9$	EVALUATE EACH SIDE 2 is NOT a solution.
b. $4 + 5y < 18$	$4 + 5(2) \stackrel{?}{<} 18$ $14 < 18$ T	EVALUATE EACH SIDE 2 IS a solution.

Checkpoint Check whether the given number is a solution of the equation or inequality.

write problem

Show substitution

Check

1. $6r + 1 = 25$; 4	2. $x^2 - 5 > 10$; 5	3. $7a < 21$; 6
$r = 4$	$x = 5$	$a = 6$
$6(4)+1=25$	$(5)^2-5>10$	$7(6)<21$
$25=25$ ✓	$25-5>10$ $20>10$ T	$42<21$ F
4 is A Solution	5 is A Solution	6 is NOT A solution

Your Notes

Example 3 *Use mental math to solve an equation*

Solve the equation using mental math.

a. $n + 6 = 11$

d. $\frac{b}{11} = 3$

SOLVE

BY SUBSTITUTING THE SOLUTION INTO THE ORIGINAL EQUATION!

	Equation	"Think"	Check
a.	$n + 6 = 11$	What number plus 6 equals 11?	C: $\underline{5} + 6 = 11$ $11 = 11$ ✓

Think of an equation as a question when solving using mental math.

$n=5$

SOLVE:

d. $\frac{b}{11} = 3$

$b=33$

CHECK:

C: $\frac{33}{11} = 3$

$3 = 3$ ✓

Checkpoint Solve the equation using mental math. CHECK!!!!!

Mentally Solve

4. $x + 9 = 14$	5. $5t - 4 = 11$	6. $\frac{y}{4} = 15$
$x=5$	$t=3$	$y=60$
C: $5+9=14$ $14=14$ ✓	C: $5(3)-4=11$ $15-4=11$ $11=11$ ✓	C: $\frac{60}{4}=15$ $15=15$ ✓

How to Do **Homework**
(A) write Problem
(B) Circle solution
(C) Check

(2) Check in original equation. Make sure to label check.

1.5 Use a Problem Solving Plan

Goal • Use a problem solving plan to solve problems.

Your Notes

A PROBLEM SOLVING PLAN

Use the following four-step plan to solve a problem.

Step 1 Read and Understand Read the problem carefully. Identify what you want to know and what you want to find out. Read

STEPS 2-4 make a plan Decide on an approach to solving the problem.

Step 5 Solve the problem Carry out your plan. Try a new approach if the first one isn't successful.

Step 6 Look back and Check that your answer is reasonable.

Example 1 *Read a problem and make a plan*

You have \$7 to buy orange juice and bagels at the store. A container of juice costs \$1.25 and a bagel costs \$.75. If you buy two containers of juice, how many bagels can you buy?

tells what the variable is

PROCESS

Step 1 Read and Understand *What do you know?* You know how much money you have and the price of a bagel and a container of juice.

ALWAYS Read 3 times

What do you want to find out? You want to find out the number of bagel you can buy.

QUESTION USE TO DEFINE VARIABLES

Step 2 Write key information

Step 3 Define all variables

Step 4 Define EQUATIONS

SEE NEXT PAGE →

Solution:

KI: \$7 to spend
\$1.25 – juice
\$.75 – bagel
2 Containers of juice

Variable:
B = # bagels

remember Units

EQUATION:
See example 2

Your Notes

Example 2 *Solve a problem and look back*

Solve the problem in Example 1 by carrying out the plan. Then check your answer.

Mental step!

Step 4: Mentally think about a verbal model to help write an equation.

Price of juice (in dollars)		Number of containers		Price of bagel (in dollars)		Number of bagels		Cost (in dollars)
↓		↓		↓		↓		↓
1.25	·	2	+	.75	·	b	=	7

Goal is to write an EQUATION

The equation is: $\boxed{2.50 + .75B = 7}$

Solve

STEP 5: SOLVE

$$2.50 + .75B = 7$$
$$-2.50 \qquad -2.50$$
$$\frac{.75B}{.75} = \frac{4.50}{.75}$$
$$B = 6$$

STEP 6: DOES ANSWER MAKE SENSE

mentally

Juice	Bagels		Cost
\$1.25 (2) +	\$.75 (6)	=	\$7

$2.50 + $4.50 = $7 ✓

Makes Sense ☺

STEP 7: ANSWER IN A SENTENCE

You can buy 6 bagels.

Your Notes

VOCABULARY:

Formula is an EQUATION THAT RELATES 2 OR MORE QUANTITIES.

BELOW ARE 4 SAMPLE FORMULAS.

FORMULA REVIEW

Temperature

$\boxed{C = \frac{5}{9}(F - 32),}$ where $F =$ °FAHRENHEIT and $C =$ ° CELSIUS

Simple interest

$\boxed{I = Prt,}$ where $I =$ interest, $P =$ principal, $r =$ interest rate (as a decimal), and $t =$ time

Distance traveled

MEMORIZE THIS ONE!

$\boxed{d = rt,}$ where $d =$ distance, $r =$ rate, and $t =$ time

Profit

$\boxed{P = I - E,}$ where $P =$ profit, $I =$ income, and $E =$ expenses

HOW TO DO WORD PROBLEMS:

1. Write Key INFO
2. DEFINE VARIABLE(S)
   *remember units!
3. WRITE EQUATION(S)
4. SOLVE (show work clearly)
5. Check: Ask yourself "DOES THIS ANSWER MAKE SENSE?"
6. Write answer in a sentence.

KI:

X= (UNITS)

EQ:

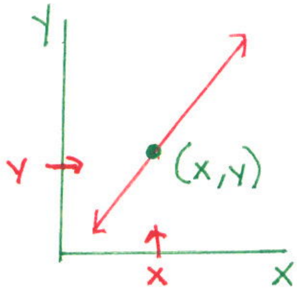
show work clearly

$\boxed{\text{Sentence}}$

1.6 Represent Functions as Rules and Tables

Goal • Represent functions as rules and as tables.

Your Notes



ALWAYS label X + Y AXIS

X	Y
** Domain	Range
Science → INDEPENDENT VARIABLE	DEPENDENT VARIABLE ← Science
INPUT	OUTPUT
x	f(x) means "y"

VOCABULARY RELATION: IS A SET OF ORDERED PAIRS: (x, y)

EXAMPLE:
(0, 3)
(3, 2)
(1, 2)

Adding (3, 1) would make THIS NOT A FUNCTION

Function IS A SPECIAL RELATION THAT HAS NO REPEATING X-VALUES. AND Given a graph it passes the vertical line Test.

Domain The collection of all x-values.

Range The collection of all y-values.

Independent variable IS THE X VARIABLE

Dependent variable IS THE Y VARIABLE

Example 1 *Identify the domain and range of a function*

The input-output table shows temperatures over various increments of time. Identify the domain and range of the function.

ADD

x **Input (hours)**	0	2	4	6	8
y **Output (°C)**	24	27	30	33	33

INPUT X

EQ: $y = 2x + 1$

OUTPUT Y

Solution

Domain: X = 0, 2, 4, 6, 8

Range: Y = 24, 27, 30, 33

ALWAYS PUT NUMBERS LOW TO HIGH

*do NOT write repeating Numbers

Your Notes

Checkpoint Identify the domain and range of the function.

1.

Input	4	7	11	13
Output	10	20	35	45

Domain $x = 4, 7, 11, 13$

Range $y = 10, 20, 35, 45$

Example 2 *Identify a function*

Tell whether the pairing is a function. Explain your reasoning.

Solution

Mapping diagrams are often used to represent functions. Take note of the pairings to make your decision.

a.

x Input	y Output
4	→ 1
8	→ 2
2	→ 3
2	→ 2

SUGGEST Create an x-y Table

x	y
4	1
8	2
2	3
2	2

NOT A FUNCTION b/c we have repeating x values (2)

b.

x Input	y Output
2	2
2	4
3	6
4	8

NOT A FUNCTION BECAUSE THERE ARE REPEATING X VALUES (2's)

Checkpoint Tell whether the pairing is a function.

2.

Input	5	5	10	15
Output	3	4	6	8

$\boxed{\text{NOT A FUNCTION}}$

Circle 5's b/c there are repeating x-values

3.

Input	0	4	12	20	21
Output	3	5	9	13	9

← ADD

$\boxed{\text{FUNCTION}}$ because there are no "x" repeating values.

(NOTE, the y-values CAN REPEAT)

Your Notes

A function may be represented using a rule that relates one variable to another.

Y

X

FUNCTIONS

Verbal Rule	Equation	Table
The output is 2 less than the input.	$y = x - 2$	see below

Input x	2	4	6	8	10
Output y	0	2	4	6	8

Example 3 *Make a table for a function*

The domain of the function $y = 3x$ is 0, 1, 2, and 3. Make a table for the function, then identify the range of the function.

Solution EQ $\boxed{y = 3x}$

x	0	1	2	3
$y = 3x$	0	3	6	9

← INPUT

→ OUTPUT

The range of the function is $y = 0, 3, 6, 9$.

Example 4 *Write a function rule*

Write a rule for the function.

Input x	3	5	7	9	11
Output y	6	10	14	18	22

RULE IS AN EQUATION IN THE **FORM:**

$y =$ ______

Solution

Let x be the input and let y be the output. Notice that each output is twice the corresponding input. So, a rule for the function is ______. → $\boxed{y = 2x}$

Homework

Checkpoint **Write a rule for the function. Identify the domain and the range.**

4.

Yarn (yd)	1	2	3	4
Total Cost ($)	1.5	3	4.5	6

Domain:
$x = 1, 2, 3, 4$

RULE: $\boxed{y = 1.5x}$

Range:
$y = 1.5, 3, 4.5, 6$

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

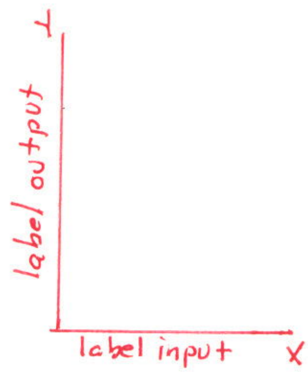
1.7 Represent Functions as Graphs

Goal • Represent functions as graphs.

Your Notes

GRAPH INCLUDES

TITLE



remember units

GRAPHING A FUNCTION

- You can use a graph to represent a FUNCTION.
- In a given table, each corresponding pair of input and output values forms an ORDERED PAIR (x, y)
- An ordered pair of numbers can be plotted as a POINT.
- The *x*-coordinate is the INPUT. (x)
- The *y*-coordinate is the OUTPUT. (Y)
- The horizontal axis of the graph is labeled with the X-axis.
- The vertical axis is labeled with the the y-axis.

Example 1 *Graph a function*

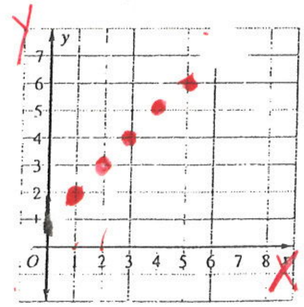
Graph the function $y = x + 1$ with domain 1, 2, 3, 4, and 5.

Solution

Step 1 Make an input-output table.

x	1	2	3	4	5
y	2	3	4	5	6

Step 2 Plot a point for each ordered pair (*x*, *y*).



① DO NOT DRAW THE LINE!

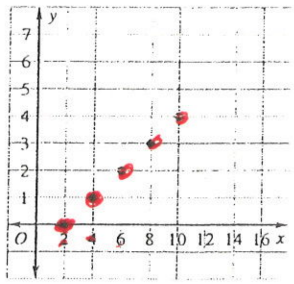
(BECAUSE YOU ARE GIVEN SPECIFIC DOMAIN VALUES)

② LABEL X AND Y.

Your Notes

Example 2 *Write a function rule for a graph*

Write a function rule for the function represented by the graph. Identify the domain and the range of the funtion.



Solution

Step 1 Make a TABLE for the graph.

x	2	4	6	8	10
y	0	1	2	3	4

Step 2 Find a Relationship between the input and output values.

mental work $\begin{cases} \frac{1}{2}(4) = 2 - 1 = 1 \checkmark \\ \frac{1}{2}(6) = 3 - 1 = 2 \checkmark \end{cases}$

Step 3 Write a RULE that describes the relationship.

$\boxed{y = \frac{1}{2}x - 1}$ OR $\boxed{Y = \frac{X}{2} - 1}$

A rule for the function is $y = \frac{1}{2}x - 1$. The domain of the function is $x = 2, 4, 6, 8, 10$

The range is $y = 0, 1, 2, 3, 4$

1.7 NOTES

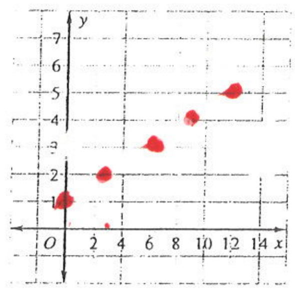
Your Notes

Checkpoint Complete the following exercise.

1. Graph the function $y = \frac{1}{3}x + 1$ with domain 0, 3, 6, 9, and 12.

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

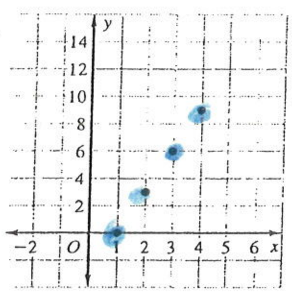
X	0	3	6	9	12
Y	1	2	3	4	5



Since the domain is stated then DO NOT DRAW a line segment

Checkpoint Write a rule for the function represented by the graph. Identify the domain and the range of the function.

2.



X	Y
1	0
2	3
3	6
4	9

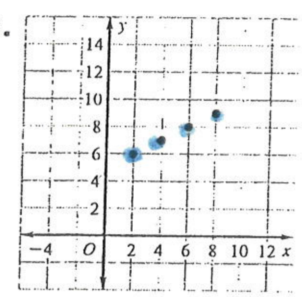
D: x = 1, 2, 3, 4

R: y = 0, 3, 6, 9

Rule: $y = 3x - 3$

$3(2) - 3 = 3$ ✓
$3(3) - 3 = 6$ ✓
$3(4) - 3 = 9$ ✓
$3(1) - 3 = 0$ ✓

3.



X	Y
2	6
4	7
6	8
8	9

D: x = 2, 4, 6, 8

R: y = 6, 7, 8, 9

Rule: $y = \frac{1}{2}x + 5$

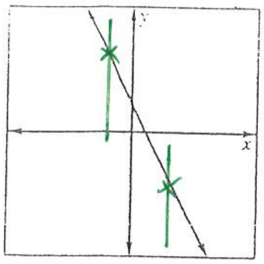
$y = \frac{1}{2}(2) + 5 = 6$ ✓
$y = \frac{1}{2}(4) + 5 = 7$ ✓
etc

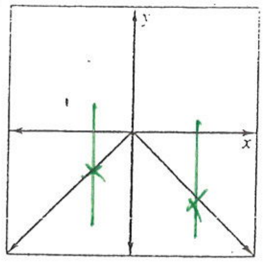
Homework

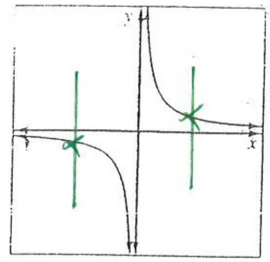
VERTICAL LINE TEST

Visual Approach

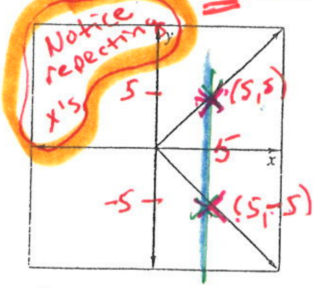
These are functions.

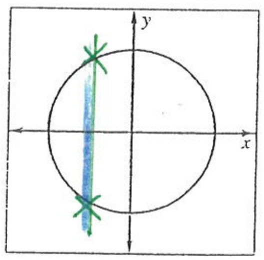


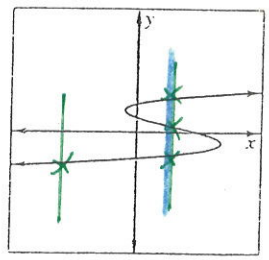




These are not functions.

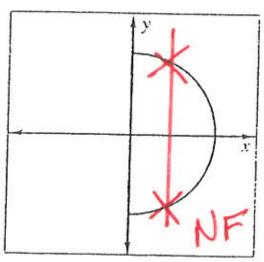




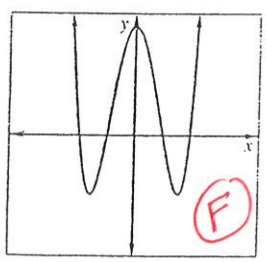


Four of the following are functions. Which are they? CIRCLE THE LETTER

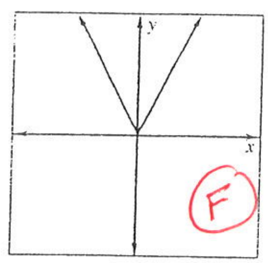
A.



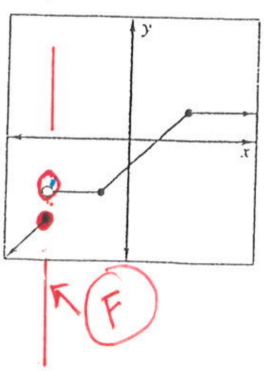
B.



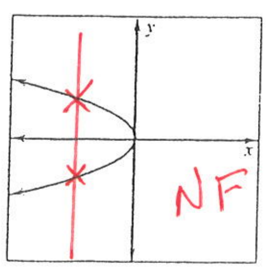
C.



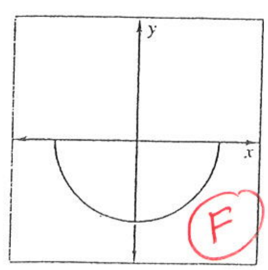
D.



E.



F.



11.7B

YOUR NOTES

What is a functio[n]

FUNCTION IS A Speciel relation with NO repeating X - VALUES

What is the vertical Line Test?

ABBREVIATED VLINE TEST

To determine if a graph is a function, Use the VLINE TEST.

∴ A VERTICAL LINE CAN ONLY TOUCH THE GRAPH IN 1 PLACE TO BE A FUNCTION.