St. Mark School
Students Entering Grades 1 through 8
Summer Work

i-Ready for Returning Students

Returning St. Mark School students are strongly encouraged to continue on his or her i-Ready Reading and Math Learning Paths. Students should progress on each content area for at least 30 minutes per week. Returning students entering Grades 1 & 2 can log-on to i-Ready using his or her Clever Badge that was provided by the classroom teacher. Returning students entering Grades 3 through 8 can log-on to Clever and i-Ready by using her or her school Google account username and password. ***i-Ready access will be paused between 7/28 and 8/25.***

The website address is: www.clever.com/in/diobpt

Students who are new to St. Mark School will be introduced to Clever and i-Ready in September.

Reading and Math Choice Boards

New and returning students are encouraged to complete some or all of the activities on the Summer Reading and Math Choice Boards. While it's not necessary to finish every activity, students should turn in whatever they have completed to earn credit toward a class reward.

Choice Boards are due by Wednesday, September 17th.

Students Entering Middle School Math Packet

New and returning students entering Grades 6 through 8 will not receive a Math Choice Board. Instead, they are encouraged to complete the Summer Math Packet. It's important that students do their best on this work to help them feel confident and prepared for the challenges of the upcoming school year.

Math Packets are due by Wednesday, September 17th.

Summer Reading Choice Board

For Students Entering Grades 5-8: Below is a grid of reading activities for you to complete over the summer so that you can continue to practice what you learned last year in school. As you finish the activity, write down the title of the book that you have read in the box. If you need more room to complete the activity use another paper and attach to this packet. If you are reading a chapter book, you can write in multiple boxes. Returning students will have access to iReady in June and July to continue working on your learning path. Return the form to your teacher by Wednesday, September 17th to earn a special class reward. There is no minimum number of squares to complete, just complete as much as you can!

Read a chapter in your book and rename the title. Title: Renamed:	Read a book with a Catholic theme. Title:	Read a book from a genre you normally don't read. Title:	Read to a sibling or a friend. Title:	Read an award winning book. Title:
Read an article/book about a historical event. Title:	Read a book by an author you've never read before. Title:	Read on a rainy day. Title:	Read a biography about someone who inspires you. Title:	Read a book with a number in the title. Title:
Borrow a book from the local library. Title:	How does the book you're reading connect to your life?	What are 3 connections you have to the main character in your book?	Read a graphic novel. Title:	Create a comic strip about a chapter you're reading. Include at least 6 boxes.
Listen to an audiobook. Title:	Reread a book you loved. Title:	Read a book recommended by a friend. Title:	Read a cookbook and make a recipe with your family. Title & Recipe:	Read a poem and complete a rhyme scheme pattern. Title:
Read a scripture passage from the Bible. Record the Biblical citation-*specify the book, chapter, and verse number of the passage*:	Find a quote/element of literature in the book and make a poster explaining why you chose it. Title:	Draw a new book cover for a book you read. Attach to paper.	If you could change the ending of the book you read, how would you change it? Title:	Read a book at the beach or the pool. Title:

ST. MARK SCHOOL • STRATFORD, CT •

Math Summer Work Packet

for Students Entering

GRADE 8

This Packet Belongs To:

Table of Contents

A Note from the Math Teacher

Dear Future Math Student & Parents/Guardians,

Enjoy your Summer! The attached packet provides a range of activities that review and expand on the math concepts your child has learned. It is designed to be worked for 15 to 30 minutes a day throughout the summer rather than completed in just a few days at the beginning or end of summer. The goal is to keep skills sharp to be ready to move forward into the next school year.

Work hard a little to keep up those math skills; also, have fun a lot of the time to give yourself a break!

Yours in Christ,
Mr. Patrick Fallon, M.Ed.

"MATH IS A JOURNEY, NOT A DESTINATION"

Order of Operations

To avoid having different results for the same problem, mathematicians have agreed on an order of operations when simplifying expressions that contain multiple operations.

1. Perform any operation(s) inside grouping symbols. (Parentheses, brackets above or below a fraction bar)
2. Simplify any term with exponents
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right

One easy way to remember the order of operations process is to remember the acronym PEMDAS or the old saying, "**P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally."

P - Perform operations in grouping symbols
E - Simplify exponents
M - Perform multiplication and division in order from left to right
D
A - Perform addition and subtraction in order from left to right
S

Example 1

$2 - 3^2 + (6 + 3 \times 2)$
$2 - 3^2 + (6 + 6)$
$2 - 3^2 + 12$
$2 - 9 + 12$
$-7 + 12$
$= 5$

Example 2

$-7 + 4 \div (2^3 - 8 \div -4)$
$-7 + 4 \div (8 - 8 \div -4)$
$-7 + 4 \div (8 - -2)$
$-7 + 4 \div 10$
$-3 \div 10$
$= 7$

Order of Operations

Evaluate each expression. Remember your order of operations process (PEMDAS).

1. $6 + 4 - 2 \cdot 3 =$

2. $(-2) \cdot 3 + 5 - 7 =$

3. $15 \div 3 \cdot 5 - 4 =$

4. $29 - 3 \cdot 9 + 4 =$

5. $20 - 7 \cdot 4 =$

6. $4 \cdot 9 - 9 + 7 =$

7. $50 - (17 - 8) =$

8. $(12 - 4) \div 8 =$

9. $12 \cdot 5 + 6 \div 6 =$

10. $18 - 4^2 + 7 =$

11. $3(2 + 7) - 9 \cdot 7 =$

12. $3 + 8 \cdot 2^2 - 4 =$

13. $16 \div 2 \cdot 5 \cdot 3 \div 6 =$

14. $12 \div 3 - 6 \cdot 2 - 8 \div 4 =$

15. $10 \cdot (3 - 6^2) + 8 - 2 =$

16. $6.9 - 3.2 \cdot (10 \div 5) =$

17. $32 \div [16 \div (8 - 2)] =$

18. $[10 \div (2 \cdot 8)] - 2 =$

19. $180 - [2 + (12 - 3)] =$

20. $[(3 \cdot 8) - 2 \cdot (-12)] =$

21. $\dfrac{5 + [30 - (8 - 1^2)]}{11 - 2^2} =$

22. $\dfrac{3[10 - (27 - 9)]}{4 - 7} =$

23. $5(14 - 39 - 3) + 4 \cdot 1/4 =$

24. $[8 \cdot 2 - (3 + 9)] + [8 - 2 \cdot 3] =$

25. $162 - [6(7 - 4)^2] \div 3 =$

Operations with Signed Numbers

Adding and Subtracting Signed Numbers

Adding Signed Numbers

Like Signs	Different Signs
Add the numbers & carry the sign	Subtract the numbers & carry the sign of the larger number
(+) + (+) = + (+3) + (+4) = +7	(+) + (–) = ? (+3) + (–2) = +1
(–) + (–) = – (– 2) + (– 3) = (– 5)	(–) + (+) = ? (–5) + (+ 3) = –2

Subtracting Signed Numbers

Don't subtract! Change the problem to **addition** and change the sign of the **second** number. Then use the addition rules.

(+9) – (+12) = (+9) + (– 12)	(+4) – (–3) = (+4) + (+3)
(– 5) – (+3) = (– 5) + (– 3)	(–1) – (– 5) = (–1) + (+5)

Simplify. ***Do not use a calculator for this section.***

1. 9 + -4 =
2. -8 + 7 =
3. -14 – 6 =
4. -30 + -9 =
5. 14 – 20 =
6. -2 + 11 =
7. 20 – - 6 =
8. 7 – 10 =
9. -6 – -7 =
10. 5 – 9 =
11. -8 – 7 =
12. 1 – -12 =

Multiplying and Dividing Signed Numbers

If the signs are the same, the answer is *positive*

If the signs are different, the answer is *negative*

Like Signs		Different Signs	
(−)(+) = +	(−3)(+4) = +12	(+)(−) = −	(+2)(−3) = −6
(−)(−) = +	(−5)(−3) = +15	(−)(+) = −	(−7)(+1) = −7
(+)/(+) = +	(+3)/(+4) = +12	(+)/(−) = −	(+2)/(−3) = −6
(+)/(+) = +	(+3)/(+4) = +12	(−)/(+) = −	(−7)/(+1) = −7

Simplify. ***Do not use a calculator for this section.***

1. (-5)(-3) =

2. $\frac{-6}{2}$ =

3. (2)(4) =

4. $\frac{-12}{-4}$ =

5. (-1)(-5) =

6. $\frac{-18}{2}$ =

7. $\frac{-7}{-1}$ =

8. (5)(-4) =

9. $\frac{8}{-4}$ =

10. (-2)(7) =

11. $\frac{-20}{-1}$ =

12. (2)(-5) =

Rounding Numbers

Step 1: Underline the place value in which you want to round.

Step 2: Look at the number to the right of that place value you want to round.

Step 3: If the number to the right of the place value you want to round is less than 5. keep the number the same and drop all other numbers.

If the number to the right of the place value you want to round is 5 or more. round up and drop the rest of the numbers.

Example: Round the following numbers to the tenths place.

Tenths

1. 23.1246 — 2 is less than 5 so keep the 1 the same — 23.1

2. 64.2685 — 6 is greater than 5 so add one to the 2 — 64.3

3. 83.9721 — 7 is greater than 5 so add one to the 9

$$\begin{array}{r} {\scriptstyle 1} \\ 83.9721 \\ +\ \ 1 \\ \hline 84.0 \end{array}$$

84

Round the following numbers to the **tenths** place.

1. 18.6231 _____
2. 25.0543 _____
3. 3.9215 _____
4. 36.9913 _____
5. 15.9199 _____
6. 0.2658 _____
7. 100.9158 _____
8. 19.9816 _____
9. 17.1083 _____
10. 0. 6701 _____

Evaluating Expressions

Example
Evaluate the following expression when x = 5

Rewrite the expression substituting 5 for the x and simplify

a. $5x =$ $5(5) = 25$
b. $-2x =$ $-2(5) = -10$
c. $x + 25 =$ $5 + 25 = 30$
d. $5x - 15 =$ $5(5) - 15 = 25 - 15 = 10$
e. $3x + 4 =$ $3(5) + 4 = 19$

Evaluate each expression given that: x = 5 y = -4 z = 6

1. $3x$

2. $y - 4$

3. $3x^2 + y$

4. $2(x + z) - y$

5. $5y + z$

7. $xy + z$

8. $2x + 3y - z$

Evaluate each expression given that: $x = 5$ $y = -4$ $z = 6$

9. $5x - (y + 2z)$

10. $\frac{xy}{2}$

11. $x^2 + y^2 + z^2$

12. $2x(y + z)$

13. $5z + (y - x)$

14. $2x^2 + 3$

15. $4x + 2y - z$

16. $\frac{yz}{2}$

Combining Like Terms

What is a ***term***? The parts of an algebraic expression that are separated by an addition or subtraction sign are called ***terms***.
The expression $4x + 2y - 3$ has 3 terms.

What are ***like terms***? Terms with the same variable factors are called ***like terms***.
$2n$ and $3n$ are **like terms**, but $4x$ and $3y$ are not like terms because their variable factors x and y are different.

To simplify an expression, you must combine the like terms.

Examples: Simplify

1. $5x + 8x$
   $5x + 8x = (5 + 8)x = 13x$

2. $3y - 6y$
   $3y - 6y = (3 - 6)y = -3y$

3. $3x + 4 - 2x + 3$
   $3x - 2x + 4 + 3 = (3 - 2)x + 4 + 3 = x + 7$

4. $2b + 5c + 3b - 6c$
   $2b + 3b + 5c - 6c = (2+3)b + (5 - 6)c = 5b - c$

Practice: Simplify each expression

1. $6n + 5n$

2. $25b + 15b$

3. $27z + 4z$

4. $x - 5x$

5. $3n - 1 - 2n + 5$

6. $4f + 8f - 6 - 8$

7. $7t + 9 - 4t + 3$

8. $2k + 4 - 8k - 1$

9. $4r + 3r + 8y - 2y$

10. $8g + 9h - 4g - 5h$

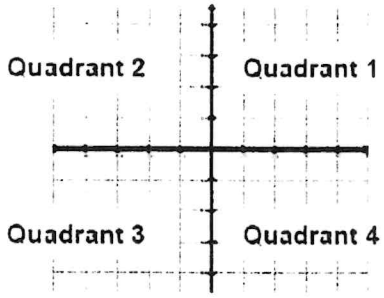
11. $2m + 3n - 4m + 5n$

12. $a + 5b - 2a + 9b$

Graphing

Points in a plane are named using 2 numbers, called a coordinate pair. The first number is called the x-coordinate. The x-coordinate is positive if the point is to the right of the origin and negative if the point is to the left of the origin. The second number is called the y-coordinate. The y-coordinate is positive if the point is above the origin and negative if the point is below the origin.

The x-y plane is divided into 4 quadrants (4 sections) as described below.

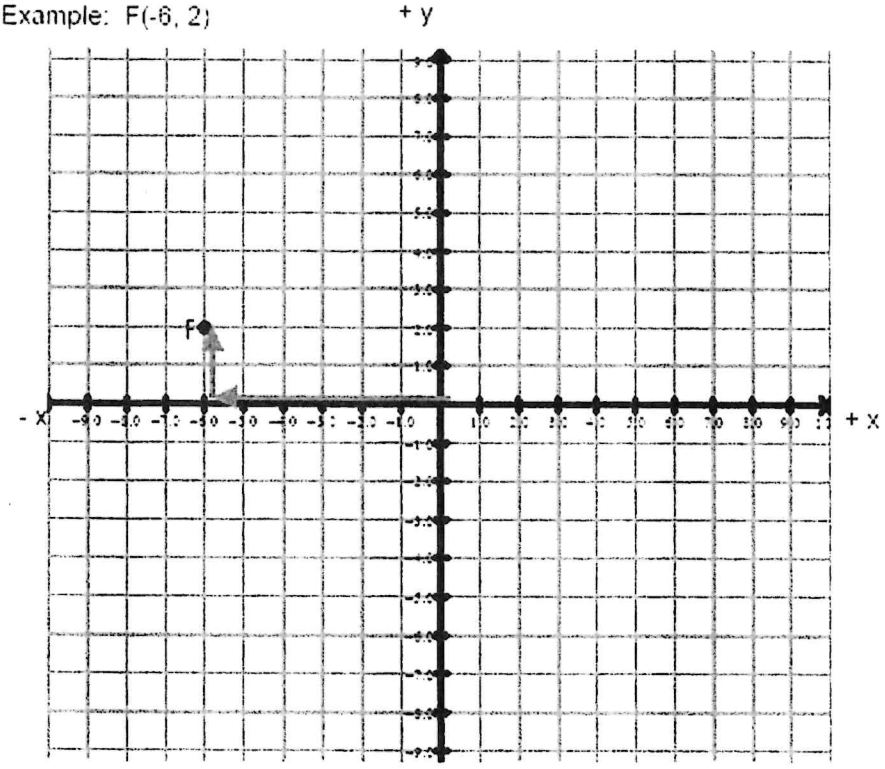


All points in Quadrant 1 has a **positive** x-coordinate and a **positive** y-coordinate (+ x, + y).
All points in Quadrant 2 has a **negative** x-coordinate and a **positive** y-coordinate (- x, + y).
All points in Quadrant 3 has a **negative** x-coordinate and a **negative** y-coordinate (- x, - y).
All points in Quadrant 4 has a **positive** x-coordinate and a **negative** y-coordinate (+ x, - y).

Plot each point on the graph below. Remember, coordinate pairs are labeled (x, y). Label each point on the graph with the letter given.

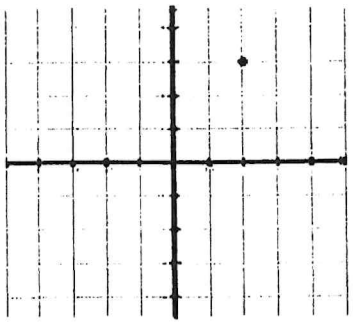
1. A(3, 4) 2. B(4, 0) 3. C(-4, 2) 4. D(-3, -1) 5. E(0, 7)

Example: F(-6, 2)

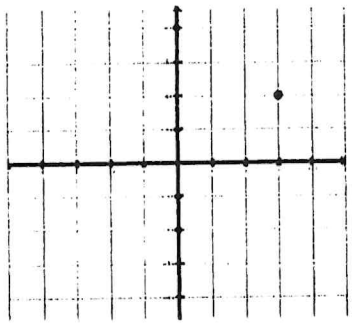


Determine the coordinates for each point below:

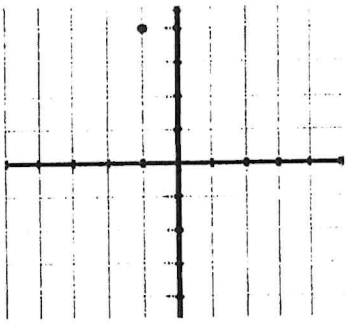
Example. (2 , 3)



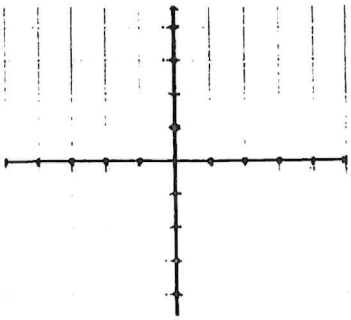
6. (____, ____)



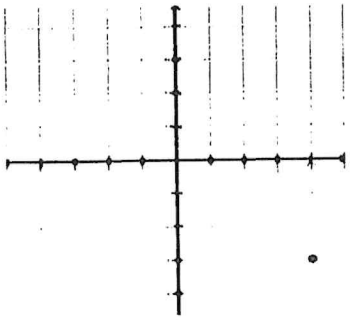
7. (____, ____)



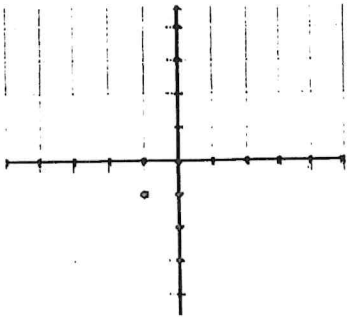
8. (____, ____)



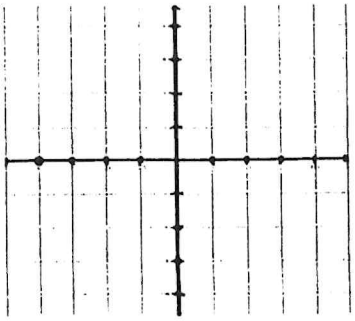
9. (____, ____)



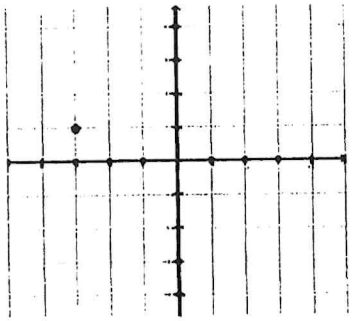
10. (____, ____)



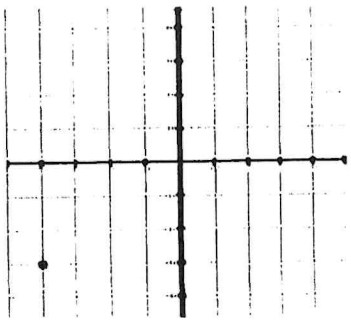
11. (____ ____)



12. (____, ____)



13. (____, ____)



Solving Equations

To solve an equation means to ***find the value*** of the variable. We solve equations by isolating the variable using opposite operations.

> ***Opposite Operations:***
> Addition (+) & Subtraction (–)
> Multiplication (x) & Division (÷)

Example:

Solve.

$3x - 2 = 10$
$+2 \quad +2$ — Isolate 3x by adding 2 to each side

$\frac{3x}{3} = \frac{12}{3}$ — Simplify
Isolate x by dividing each side by 3

$x = 4$ — Simplify

> ***Please remember...***
> to do the same step on each side of the equation.

> **Always check your work by substitution!**

Check your answer

$3(4) - 2 = 10$ — Substitute the value in for the variable.
$12 - 2 = 10$ — Simplify
$10 = 10$ — Is the equation true? If yes, you solved it correctly!

Try These:

Solve each equation below.

1. $x + 3 = 5$

2. $w - 4 = 10$

3. $c - 5 = -8$

4. $3p = 9$

5. $-7k = 14$

6. $-x = -17$

7. $\frac{h}{3} = 5$

8. $\frac{m}{8} = 7$

9. $\frac{4}{5}d = 12$

10. $\frac{3}{8}j = 6$

11. $2x - 5 = 11$

12. $4n - 1 = 9$

13. $5j - 3 = 12$

14. $2x + 11 = 9$

15. $-3x + 4 = -8$

16. $-6x + 3 = -9$

17. $\frac{f}{3} + 10 = 13$

18. $\frac{a}{7} - 4 = 2$

19. $\frac{b+4}{2} = 5$

20. $\frac{x-6}{5} = -3$

Use substitution to determine whether the solution is correct.

21. $4x - 5 = 7 \qquad x = 3$

22. $-2x + 5 = 13 \qquad x = 4$

23. $6 - x = 8 \qquad x = 2$

24. $1 - x = 9 \qquad x = -8$

Inequalities

An inequality is a statement containing one of the following symbols:

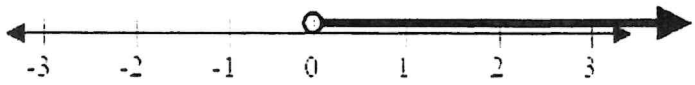
$<$ is less than $>$ is greater than $\leq$ is less than or equal to $\geq$ is greater than or equal to

An inequality has many solutions, and we can represent the solutions of an inequality by a set of numbers on a number line.

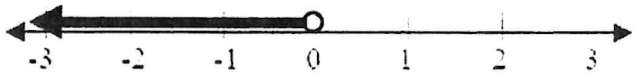
When graphing an inequality, $<$ and $>$ use an open circle ○ $\leq$ and $\geq$ use a closed circle ●

Examples

$x > 0$



$x < 0$

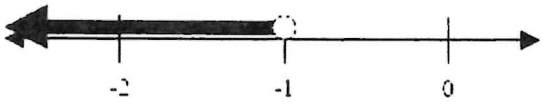


$x \geq -8$

$x \leq -8$

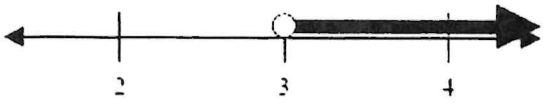
Practice: Write an inequality to represent the solution set that is shown in the graph.

1.



_____

2.

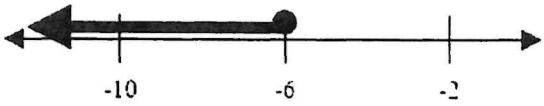


_____

3.

_____

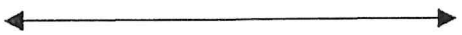
4.



_____

Graph each of the following inequalities on a number line.

1. $x > 4$



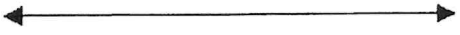
2. $k \leq -6$

3. $5 > y$

4. $j < -\frac{1}{2}$

5. $-2 \leq t$

6. $w \leq 15$



Algebraic Translations - Translating from English to Mathematics

Key Words for Translations:

Add	Subtract	Multiply	Divide	Inequalities	Variable	=
Plus Sum Longer Than Greater Than Together Total Increased More Than In all And	Decreased Smaller Less than Difference Reduced Differ Fewer Shorter Than Minus Diminished	Per For Every For each Triple Multiplied Of Times Twice Double	One-third Quotient Divided by Each part Half as much Split equally	< is less than > is greater than $\leq$ is less than or equal to $\geq$ is greater than or equal to	a number some number quantity	Same as Equals Is Total Was Result Outcome Answer

Examples:

A) Translate into a mathematical expression: 3 less than 5 times some number

3	**less than**	5	**times**	**some number**
to subtract from		multiply		use a variable

Translation: $5n - 3$

B) Translate into a mathematical statement: 3 less than 5 times some number is 22

3	**less than**	5	**times**	**some number**	**is**	22
to subtract from		multiply		use a variable		=

Translation: $5n - 3 = 22$

C) Translate into a mathematical statement: the quotient of a number and –4, less 8 is -42

The quotient of a **number** and -4,	**less** 8	**is**	-42
Divide a variable and a number	subtract	=	

Translation: $\frac{n}{-4} - 8 = -42$

D) Translate into a mathematical statement: four plus three times a number is less than or equal to 18

four **plus**	three **times**	**a number**	**is less than or equal to**	18
add	multiply	use a variable	$\leq$	

Translation: $4 + 3n \leq 18$

Practice: Translate each phrase into a mathematical statement

1. Seven plus five times a number is greater than or equal to -9

2. Eight times a number increased by 6 is 62

3. One half of a number is equal to 14

4. 6 less than 8 times some number

5. a number divided by 9

6. p decreased by 5

7. twice a number decreased by 15 is equal to -27

8. 9 less than 7 times some number is -9

9. the sum of a number and eight is less than 2

10. eleven increased by a number is -12

Matching – Put the letter of the algebraic expression that best matches the phrase.

_____ 1. two more than a number	a. $2x$
_____ 2. two less than a number	b. $x + 2$
_____ 3. half of a number	c. $2 - x$
_____ 4. twice a number	d. $x - 2$
_____ 5. two decreased by a number	e. $\frac{x}{2}$

Careful! Pay attention to subtraction. The order makes a difference. Translate to an algebraic expression, then reread to check!

Word Problems

Translate each word problem into an algebraic equation, using x for the unknown, and solve. Write a **"let x ="** for each unknown, write an equation, solve the equation, substitute the value for x into the let statements(s) to answer the question.

For Example:

Kara is going to Maui on vacation. She paid $325 for her plane ticket and is spending $125 each night for the hotel. How many nights can she stay in Maui if she has $1200?

Step 1: What are you asked to fine? Let variables represent what you are asked to find.

How many nights can Kara stay in Maui?

Let x = The number of nights Kara can stay in Maui

Step 2: Write an equation to represent the relationship in the problem

$325 + 125 x = 1200$

Step 3: Solve the equation for the unknown

$$\begin{array}{rl} 325 + 125x = & 1200 \\ -325 \qquad\quad & -325 \\ 125x = & 875 \\ x = & 7 \end{array}$$

Kara can spend 7 nights in Maui

Word Problem Practice Set

1. A video store charges a one-time membership fee of $12.00 plus $1.50 per video rental. How many videos can Stewart rent if he spends $21?

2. Bicycle city makes custom bicycles. They charge $160 plus $80 for each day that it takes to build the bicycle. If you have $480 to spend on your new bicycle, how many days can it take Bicycle City to build the bike?

3. Darel went to the mall and spent $41. He bought several t-shirts that each cost $12 and he bought 1 pair of socks for $5. How many t-shirts did Darel buy?

4 Janet weights 20 pounds more than Anna. If the sum of their weights is 250 pounds, how much does each girl weigh?

5. Three-fourths of the student body attended the pep rally. If there were 1230 students at the pep rally, how many students are there in all?

6. Two-thirds of the Algebra students took the H S A the first time. If 60 students took the algebra H S A how many algebra students are there in all?

7 The current price of a school t-shirt is $10.58. Next year the cost of a t-shirt will be $15.35. How much will the tee shirt increase next year?

8 The school lunch prices are changing next year. The cost of a hot lunch will increase 30.45 from the current price. If the next year's price is $2.60, what is a hot lunch cost this year?

9 Next year the cost of gasoline will increase $1.25 from the current price. If the cost of a gallon of gasoline next year will be $4.50, what is the current price of gasoline?

10. Sarah drove 3 hours more than Michael on their trip to Texas. If the trip took 37 hours, how long did Sarah and Michael each drive?