SCHEME OF WORK FOR J SS 2

WEEK 1 REVIEW OF FIRST TERM WORK, EXPANDING AND FACTORIZING ALGEBRAIC EXPRESSIONS, SOLVING OF QUADRATIC EQUATIONS.

WEEK 2 WORD PROBLEMS ON ALGEBRAIC FRACTION

WEEK 3 LINEAR INEQUALITIES

WEEK 4 LINEAR INEQUALITIES IN ONE VARIABLE, GRAPHICAL PRESENTATIONS OF SOLUTION OF LINEAR INEQUALITIES.

WEEK 5 GRAPHS OF LINEAR EQUATIONS IN TWO VARIABLES

WEEK 6 PLANE FIGURES OR SHAPES, IDENTIFICATION OF PLANE SHAPES WITH THEIR PROPERTIES.

WEEK 7 REVIEW OF THE FIRST HALF TERMS’S AND PERIODIC TEST

WEEK 8 SCALE DRAWING OF LENGTH AND DISTANCES

WEEK 9 QUANTITATIVE APTITUDE PROBLEMS

WEEK 10 REVISION OF SECOND HALF TERM’S WORK.

WEEK 11 REVISION

WEEK 12 EXAMINATION.

WEEK 2 WORD PROBLEM LEADING TO ALGEBRAIC EXPRESSION

Sometimes you may be asked to solve problem given in words. To do this you need to convert the words into an algebraic equation and then solve it. The following points will show you what to do.

a. Read the equation carefully and then decide what the unknown number is

b. Where necessary, change all the unit of measurement to the same unit

c. Use a letter to represent the unknown

d. Use the information provided to write the required equation

e. Solve the equation as usual

f. Use the solution obtained to answer the questions in words

g. You can check your answer as usual.

**Example1:** Think of a number, add 5 to it and multiply the result by 3, the answer is 36. What is the number?

**Example 2:**The sum of a number and 9 is multiplied by -2 and the answer is -8. Find the number

**Example 3:** The smallest of three consecutive odd number is n, if their sum is 27. Find the three numbers.

**Solution:**

Note the rules above. Follow the steps.

1. Let the number be X, add 5 to it, = X + 5, multiple by 3

3(X+5), the answer is 36

Open the bracket 3(X+5) = 36 [use the 3 to multiply the equation]

3x + 15 = 36 [subtract 15 from both side]

3X + 15 – 15 = 36 – 15

3X = 21[divide both side by 3

3X/3 = 21/3

X = 7

Check

3(7+5)

3X12=36

2. Let X be the number, X + 9, multiply by -2,

-2(X + 9), the answer is -8

-2(X + 9) = -8 [open the bracket]

-2X -18 = -8

Collect the like term

-2X = -8 + 18 [the sign we change to positive]

-2x = 10

Divide both sides by -2

-2X/-2 = 10/-2

X = -5

Check

-2(-5+9)

-2(+4) = -8

3. Let the first number be n, second number to be n+2, third number be n+4.

Note that odd number are 1, 3, 5, 7, the difference between each number is 2.

N+N+2+N+4 = 27

Collect the like term

3N + 6 = 27 [subtract 6 from both sides]

3N = 27 – 6

3N = 21

Divide both sides by 3

3N/3 = 21/3

N = 7

N =7, N+2= 7+2 = 9, N + 4 = 7 + 4 = 11

Therefore the consecutive numbers are 7, 9, and 11

**EVAULATION:** Translate the following statement into algebraic equations and then solve them

* 1. Think of a number, and 5, the result is 10. What is the number?
  2. Two market women shared a basket full of oranges in order to sell them. The share of the first woman is twice the other. If there are 300 oranges in the basket. What is the share of each woman?
  3. The sum of three consecutive even numbers is 60. Find the numbers.

**ASSIGNMENT:** PAGE 159 EXERCISE 13.5 NO 4, 6,8,15, AND 18

WEEK 3 LINEAR INEQUALITIES

Inequality is an algebraic expression formed by replacing the equal sign of an equation with an inequality symbol. e.g. 7X + 5 = 16 (equation while 5X + 7 > 9 (inequality).

The following are commonly used in an inequality symbol.

V

SYMBOL MEANING REPRESENTATION

< LESS THAN

> GREATER THAN

≤ LESS THAN OR EQUAL TO

≥ GREATER THAN OR EQUAL TO

We often use inequality in our everyday life. We can write them as algebraic statement. For example, if the speed of a car is 250km/h or less, we can write this as S ≤ 250, where s represent speed.

GRAPH OF INEQUALITIES

A linear inequality has no square or higher power of the unknown. In other words, the power of the unknown is 1.

Example 1: 2x > 15 is a linear inequality in one variable. (X).

Solution:

2X > 10 [divide both side by 2

2X/2 > 10/2

X = 5.

1 2 3 4 5 6 7 8

The empty circle at the end of the arrow shows that 5 is not included in the range

COMBINNING INEQUALITIES

When combining inequalities (sometimes an unknown quantity obeys more than one inequality). These inequalities may be combined as one statement, the smallest number must be written first followed by the unknown and finally the largest number and vice-versa. For example, the diagram below shows that X can take any value from -2 to 3

-6 -5 -4 -3 -2 -1 0 1 2 3 4

Hence the inequalities are X ≥ -2 and X < 3

But X ≥ -2 in reverse is written as a ≤ X and X < 3 can be combined as a single inequality as follows

-2 ≤ X ≤ 3.

Example1:

-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6

X ≥ -1, X ≤ 5

-1 ≤ x ≤ 5

Example 2:

-5 -4 -3 -2 -1 0 1 2

X > -5, X ≤ 2

-5 < X ≤ 2

**EVAULATION:** PAGE 167 EXERCISE 14.1 NO 1 (I,J,K,L), NO 3 (J,K,L), NO 5( E,F,G,H).

PAGE 169 EXERCISE 14.2 NO 1(A,B,C,D)

**ASSIGNMENT:** PAGE 169 EXERCISE 14.2 NO 2 ( A TO H)

WEEK 4 SOLVING INEQUALITIES

**RULES IN SOLVING INEQUALITIES.**

* 1. An inequality remains true when the same quantity is **added to**, or **subtracted from** both side.
  2. An inequality remains true when both sides are **multiplied or divided** by the same **positive quantity.**
  3. An inequality remains true when both sides are **multiplied or divided** by a **negatives quantity provided the inequality sign is reversed.**

**Example 1:** Find the greatest possible value of a X that satisfies the inequality 8 + 2X > 3 + 5X. if X is an integer.

Solution:

8 + 2X > 3 + 5X

Subtract 8 from both sides

2X > 3 – 8 + 5X

2X > -5 + 5X

Subtract 5X from both sides

2X – 5X > -5 = -3x > -5

Divide both sides by -3 and also reverse the inequality

X < 12/3 [rule three]

The greatest integer value of X is 1.

**Example2:** Find the smallest integer value of X that satisfies the inequality 7X – 2 ≥ 5X – 6

**Solution:**

7X – 2 ≥ 5X – 6

Add 2 to both sides

7X ≥ 5X – 6 + 2

7X ≥ 5X – 4

Subtract 5X from both sides

7X – 5X ≥ -4 = 2x ≥ -4 , Divide both side by 2

X ≥ -2

WORD PROBLEMS LEADING TO INEQUALITIES

**Example 1**: David is X years old. In 4 year time his age will still be less than 12 years. (a) Write this information in an inequality in X. (b) Find the maximum age of David to the nearest whole numbers.

**Solution:**

In 4 year time David age’s will be (X + 4) years.

If at that time his age will be less than 12, then

X + 4 < 12

Subtract 4 from both sides

X < 12 – 4

X < 8.

The maximum age of David is 7 years.

**Example 2:** A man had #X, out of this, he used #1000 to pay his house rent. The amount he had left is not more than 3500. (a) Write this information in an inequality in X (b) Solve for X.

Solution:

The man used #1000 to pay his house rent out of #X, so the amount left is #(x – 1000).

This amount is not more than 3500

X – 1000 ≤ 500

Add 1000 to both sides

X ≤ 500 + 1000 = X ≤ 1500

Hence the man had less than or equal to #1500

**EVALUATION:** PAGE 172 EXERCISE 14.3 N0 3(K,L,M,N AND O), PAGE 173 EX 14.4 N0 1, 2 AND 3

**ASSIGNMNET:** PAGE 172 AND 173 EX 14.3 AND 14.4 N0 5, AND 6, 7, 8 AND 9 IN EX 14.4

**WEEK 5 GRAPH OF LINEAR EQUATIO N**

|  |  |
| --- | --- |
|  | **There are several ways to graph a straight line given its equation.** |

Let's quickly refresh our memories on equations of straight lines:

|  |  |  |  |
| --- | --- | --- | --- |
| **Slope Intercept Form** | **Point Slope Form** | **Horizontal Lines** | **Vertical Lines** |
| **http://www.regentsprep.org/regents/math/algebra/ac1/EqLine1.gif** when stated in "y=" form, it quickly gives the slope, *m*, and where the line crosses the y-axis, *b,* called the y-intercept. | http://www.regentsprep.org/regents/math/algebra/ac1/EqLine2.gif when graphing, put this equation into "y = " form to easily read graphing information. | *y* = 3 (or any number) horizontal lines have a slope of zero - they have "run", but no "rise" -- all of the y values are 3. | *x* = -2 (or any number) vertical lines have no slope (it does not exist) - they have "rise", but no "run" --all of the *x* values are -2. |

**Graphing Tidbits:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| |  | | --- | | **If a point lies on a line, its coordinates make the equation true.**  (2,1) in on the line *y* = 2*x* - 3 because 1 = 2(2) - 3 | | |  | | --- | | **Before graphing a line, be sure that your equation starts with "y=".**  To graph 6*x* + 2*y* = 8 rewrite the equation: 2*y* = -6*x* +8 *y* = -3*x* + 4 Now graph the line using either slope intercept method or chart method. | | |  | | --- | | The *x*-coordinate may be called the **abscissa.**  The *y*-coordinate may be called the **ordinate.** | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  |  | | --- | --- | --- | | |  |  | | --- | --- | |  | **Equations and Graphing** [**Topic Index**](http://www.regentsprep.org/regents/math/algebra/ac1/indexAC1.htm) **|** [**Algebra Index**](http://www.regentsprep.org/regents/math/algebra/math-ALGEBRA.htm) **|** [**Regents Exam Prep Center**](http://regentsprep.org) | |      |  |  | | --- | --- | |  | **There are several ways to graph a straight line given its equation.** |   Let's quickly refresh our memories on equations of straight lines:   |  |  |  |  | | --- | --- | --- | --- | | **Slope Intercept Form** | **Point Slope Form** | **Horizontal Lines** | **Vertical Lines** | | **http://www.regentsprep.org/regents/math/algebra/ac1/EqLine1.gif** when stated in "y=" form, it quickly gives the slope, *m*, and where the line crosses the y-axis, *b,* called the y-intercept. | http://www.regentsprep.org/regents/math/algebra/ac1/EqLine2.gif when graphing, put this equation into "y = " form to easily read graphing information. | *y* = 3 (or any number) horizontal lines have a slope of zero - they have "run", but no "rise" -- all of the y values are 3. | *x* = -2 (or any number) vertical lines have no slope (it does not exist) - they have "rise", but no "run" --all of the *x* values are -2. |   **Graphing Tidbits:**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  | | --- | | **If a point lies on a line, its coordinates make the equation true.**  (2,1) in on the line *y* = 2*x* - 3 because 1 = 2(2) - 3 | | |  | | --- | | **Before graphing a line, be sure that your equation starts with "y=".**  To graph 6*x* + 2*y* = 8 rewrite the equation: 2*y* = -6*x* +8 *y* = -3*x* + 4 Now graph the line using either slope intercept method or chart method. | | |  | | --- | | The *x*-coordinate may be called the **abscissa.**  The *y*-coordinate may be called the **ordinate.** | |   **Methods of Graphing a Line**   |  |  | | --- | --- | | **Using *y* = *mx* + *b* with rise/run** | **Using a Chart - Plotting Points** | | **Graph  2*y* = 6*x* + 4**  **1.**  Put your equation in "y=" form.             ***y* = 3*x* + 2**  **2.**  The number in front of *x* is the slope.      (If necessary, place this number over 1 to       form a fraction for your rise/run.)                     **slope = 3/1**  **3.**  The "*b*" value is where the line crosses the      *y*-axis.  Be sure to check the sign of this      number.***b* = 2**                     **4.**  Plot the *b* value on the *y*-axis.                     **see graph below**  **5.**  Standing at this point, use your rise and run      values to plot your second point.      (If rise is positive, move up.  If rise is negative,       move down.)      (If run is positive, move right.  If run is       negative, move left.)  **6.**  Connect the two points to form the line.  http://www.regentsprep.org/regents/math/algebra/ac1/EqLine10.gif | **Graph  2*y* = 6*x* + 4**   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | **X** | **Y** | | -3 |  | | -2 |  | | -1 |  | | 0 |  | | 1 |  | | 2 |  | | 3 |  | | Create a chart to hold *x* and *y* values from your line.  For lines, the *x*-values usually range from -3 to +3, but may be any values you wish.  While charts often contain more than 2 entries, only two entries are needed to determine a straight line.  A third point should be used to "check" that an error was not made while computing the first two points. | | |  |  | | --- | --- | | **X** | **Y** | | -3 | -7 | | -2 | -4 | | -1 | -1 | | 0 | 2 | | 1 | 5 | | 2 | 8 | | 3 | 11 | | Substitute the *x*-values into the equation to determine the *y*-values.  Putting the equation in "y=" form first will make the substitution easier. *y* = 3*x* + 2  Now start substituting.  For example, substitute *x* = -3: *y* = 3 (-3) +2 =  -9 + 2 = -7 | | Plot the (*x,y*) coordinates to graph the line. | |   http://www.regentsprep.org/regents/math/algebra/ac1/fixpic3.gif |  |  |  | | --- | --- | | |  | | --- | |  | |  |  |  | | --- | --- | |  |  | |

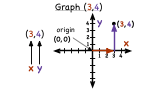
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# How Do You Graph a Linear Equation by Making a Table?

### Note:

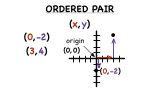
Graphing a function? It would be really helpful if you had a table of values that fit your equation. You could plot those values on a coordinate plane and connect the point to make your graph. See it all in this tutorial!

#### Graphing in the Coordinate Plane

* + - [](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/coordinate-plane-graph-points-example)

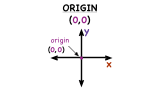
#### [How Do You Plot Points in the Coordinate Plane?](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/coordinate-plane-graph-points-example)

Knowing how to plot ordered pairs is an essential part of graphing functions. In this tutorial, you'll see how to take an ordered pair and plot it on the coordinate plane. Take a look!

* + - [](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/ordered-pair-definition)

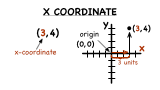
#### [What is an Ordered Pair?](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/ordered-pair-definition)

Ordered pairs are a fundamental part of graphing. Ordered pairs make up functions on a graph, and very often, you need to plot ordered pairs in order to see what the graph of a function looks like. This tutorial will introduce you to ordered pairs!

* + - [](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/origin-definition)

#### [What is the Origin?](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/origin-definition)

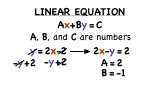
The coordinate plane has two axes: the horizontal and vertical axes. These two axes intersect one another at a point called the origin. Learn about the ordered pair that indicates the origin and its location in the coordinate plane by watching this tutorial!

* + - [](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/)

#### [What is the X-Coordinate?](http://www.virtualnerd.com/algebra-1/relations-functions/coordinate-plane/coordinate-plane-graphing/)

Ordered pairs are a crucial part of graphing, but you need to know how

#### Identifying Linear Equations

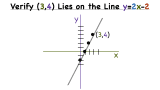
* + - [](http://www.virtualnerd.com/algebra-1/relations-functions/graphing-linear-equations/identifying-linear-equations/linear-equation-standard-form-definition)

#### [What's Standard Form of a Linear Equation?](http://www.virtualnerd.com/algebra-1/relations-functions/graphing-linear-equations/identifying-linear-equations/linear-equation-standard-form-definition)

A linear equation can be written in many different forms, and each of them is quite useful! One of these is standard form. Watch this tutorial and learn the standard form for a linear equation!

### Further Exploration

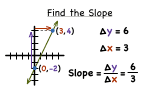
#### Working With Graphs

* + - [](http://www.virtualnerd.com/algebra-1/relations-functions/graphing-linear-equations/graphs-examples/check-point-line-graph)

#### [How Do You Check if a Point is on a Line If You Have a Graph?](http://www.virtualnerd.com/algebra-1/relations-functions/graphing-linear-equations/graphs-examples/check-point-line-graph)

Wonder if a point is part of a line? You could take that equation and graph it. Then use the graph to get your answer! Watch how in this tutorial.

#### Finding Slopes

* + - [](http://www.virtualnerd.com/algebra-1/linear-equation-analysis/slope-rate-of-change/slope-examples/slope-from-graph)

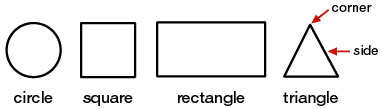
**WEEK 6 PLANE SHAPES AND THEIR PROPERTIES**

## Identify Plane Shapes and Solid Shapes: Overview

Geometry and spatial relationships are a part of children's daily lives. Understanding an object's position in space and learning the vocabulary to describe position and give directions are important. Simple terms like **above, below, left, right,** or **between,** enable children to order and describe the world around them. They can apply these terms as they describe plane and solid shapes in the classroom.

Most of the objects that we encounter can be associated with basic shapes. A closed, two-dimensional or flat figure is called a **plane shape.** Different plane shapes have different attributes, such as the numbers of **sides** or **corners.** A side is a straight line that makes part of the shape, and a corner is where two sides meet. In this chapter, children will learn to identify, describe, sort, and classify plane shapes by these attributes.

Although children are familiar with the most common shapes, up until now they may not have been able to verbalize what distinguishes a square from a rectangle or a circle from a triangle. They will learn to describe shapes in terms of their sides and corners. A **triangle** is a shape with three sides and three corners. A **rectangle** is a shape with four sides and four corners. They may notice that opposite sides are the same length. A **square** is a rectangle in which all four sides are of equal length. A **circle** is a round shape that has no sides or corners. These attributes, as well as size, can be used to sort and classify shapes.



**PROPETIES OF PLANE SHAPES**

## Square

* A square has four sides, but not just any four sides. A square's four sides are all the same length. A square with one-inch sides is smaller than a square with three-inch sides because one is less than three. A square also has four corners. Opposite side are equal, the diagonal bisect at right angles. It has four line of symmetry.

## Rectangle

* a rectangle has two equal sides of one length and two equal sides of a different length. A rectangle is like a stretched square.. Both figures have four corners, but no longer four equal sides for the rectangle. Write their findings on the board under headings "square," "rectangle" and "both." The diagonal are equal, and they bisect each other. it has two line of symmetry.

## Triangle

Two side are equal, the base angles are equal (isosceles triangle). All the three sides are equal, all the angles are equal which is 60, it has three line of symmetry. (equilateral triangles)

## Circle

* Give each child a piece of string. Ask them to make circles with the string on their desks. Discuss how many sides and corners a circle has: none. Let each child pick a piece of construction paper. Fold it in half and show them how to trim the edges; open it up and it's a circle. For homework, tell the class to take home their circle, find unneeded items that are circles and glue them on the construction paper. The next day post the artistic circles on the bulletin board.

**WEEK 7 MID TERM REVIEW HALF LESSON**

**WEEK 8 SCALE DRAWING**

Since it is not always possible to draw on paper the actual size of real-life objects such as the real size of a car, an airplane, we need scale drawings to represent the size like the one you see below of a van.

|  |  |
| --- | --- |
|  |  |

C:\Program Files\Microsoft Office\MEDIA\CAGCAT10\j0212957.wmf  
  
In real-life, the length of this van may measure 240 inches. However, the length of a copy or print paper that you could use to draw this van is a little bit less than 12 inches  
  
Since 240/12 = 20, you will need about 20 sheets of copy paper to draw the length of the actual size of the van  
  
In order to use just one sheet, you could then use 1 inch on your drawing to represent 20 inches on the real-life object  
  
You can write this situation as 1:20 or 1/20 or 1 to 20  
  
Notice that the first number always refers to the length of the drawing on paper and the second number refers to the length of real-life object  
  
**Example #1:**  
  
Suppose a problem tells you that the length of a vehicle is drawn to scale. The scale of the drawing is 1:20  
  
If the length of the drawing of the vehicle on paper is 12 inches, how long is the vehicle in real life?  
  
Set up a proportion that will look like this:

|  |  |
| --- | --- |
| http://www.basic-mathematics.com/images/proportion-for-scale-drawing.gif |  |

Do a cross product by multiplying the numerator of one fraction by the denominator of the other fraction  
  
We get :   
  
Length of drawing × 20 = Real length × 1  
  
Since length of drawing = 12, we get:  
  
12 × 20 = Real length × 1  
  
240 inches = Real length  
  
**Example #2:**  
  
The scale drawing of this tree is 1:500  
  
If the height of the tree on paper is 20 inches, what is the height of the tree in real life?

|  |  |
| --- | --- |
| http://www.basic-mathematics.com/images/tree.gif |  |

Set up a proportion like this:

|  |  |
| --- | --- |
| http://www.basic-mathematics.com/images/proportion-for-scale-drawing1.gif |  |

Do a cross product by multiplying the numerator of one fraction by the denominator of the other fraction  
  
We get :   
  
Height of drawing × 500 = Real height × 1  
  
Since height of drawing = 20, we get:  
  
20 × 500 = Real length × 1  
  
10000 inches = Real height