Maths Revision Worksheet: Algebra I Week 1 Revision 5 Problems per night

1. I know how to add and subtract positive and negative numbers.
2. I know how to add and subtract positive and negative algebraic (like) terms with the same letter raised to the same power.
3. I know how to 'Simplify Algebraic Expressions' by gathering like terms together
   Q24 / Q26 / Q27 Page 2

4. I know how to multiply and divide positive and negative numbers and algebraic terms by

   Multiplying/Dividing the **sign by sign**
   Multiplying/Dividing the **number by number**
   Multiplying/dividing the **letter by letter** (adding the powers of the any same letters when multiplying/ subtracting them when dividing)

   Keeping in mind that **like signs give plus and unlike signs give negative**

5. I know that when removing brackets in an algebraic expression **a minus sign outside of brackets changes the sign of all the terms inside the brackets.**

   -(-3) = 3 and (-3) = -3 and -(x-2) = -x +2 and -(-y+2) = y-2

6. I know how to remove brackets to simplify an algebraic expression
   Q11 / Q21 Page 4 ****************
7. I know how to evaluate expressions using **BIMDAS**.
   Q9 Page 6
8. I know I know that 'Solve' means find a numerical value for X (the variable)
9. I can solve linear equations
   Q15 / Q33 Page 8
10. I know how to solve problems using linear equations
    Q11 (i) / Q14 Page 10 ****************
11. I know that the following rules apply when plotting number lines for linear inequalities

    X Є N use Dots X Є Z use Dots X Є R use hick Line
    If < > are in the inequality and X Є N or Z then **don't dot** the number in the answer
    If ≤≥ are in the inequality and X Є N or Z then **do dot** the number in the answer
    If < > are in the inequality and X Є R then **OPEN dot** the number in the answer
    If ≤≥ are in the inequality and X Є R then **FULL dot** the number in the answer

12. I know how to solve linear inequalities by making sure that as good practice
    I keep or move x to the left of the inequality and the numbers to the right
    I make sure my answer has a positive x ... if x is negative I multiply (or divide) all terms by -1 **AND CHANGE THE DIRECTION OF THE INEQUALITY SIGN**
    Q24 / Q25 Page 18

13. I know that quadratic terms or expressions contain a variable with 2 as its highest power and I know that there are **4** methods to used to **FACTORISE** quadratic expressions.

    Highest Common Factor – find **HCF** in number and letter(s) common to the terms.. Write this HCF outside the brackets and divide each term in the expression by the HCF inside the brackets
    Q22 Page 22

    By Grouping - group the 4 terms given into 2 pairs of 2 terms and look for the HCF in each pair. This should give you a common expression inside both brackets (first factor) with the second factor made up of the terms outside of each bracket.
    Remember that you have to take care with the signs, you may have to try the pairings a second time and that some will need fixing!
    Q13 / Q21 Page 24 **********************

    Using Difference of 2 Squares
    Q10 / Q14 Page 26

    Factoring Quadratic Expressions using Guide Number Techniques (and then grouping)

    Remember +ve sign of constant in expression means factor signs will be the same – what same – same sing in middle of expression
    Remember –ve sign of constant in expression means factors signs will be different ... +ve and –ve
    Q2 /Q10 / Q48 **********************
14. I know how to use factors to simplify Algebraic expressions
    Q5 / Q6 / Q7 / Q8 / Q11 Page 21******************

Maths Revision Worksheet: Algebra II Week 2 and 3 Revision 5 Problems per night

1. I know that equations include an **'='** sign
2. I know that solving a quadratic equation involves the following steps:
   Finding the factors of the quadratic expression using the Guide Number Technique
   Letting each factor = 0 to find the values for x (i.e. x will have 2 values)
   Q2 / Q4 / Q24 / Q38 / Q40 Page 140 ******** **********
3. I know that a plot of a quadratic expression gives a parabola shape and that the values for x found when the expression is = 0 are the point on the x –axis where a plot of the quad expression cuts the x-axis!
4. I know how to set up my calculator to use the **Quadratic Formula** to solve Quadratic equations.
5. I know that I can solve any quadratic equation using the quad formula.
   Q1 Q3 Q6 Q9 Q 12 Q15 Page 142********
6. I can generate quadratic expressions to solve various problems.
   Q1 / Q10 Page 144
7. I know how to form an equation given its roots by letting 'x = to each root' and rewriting to get (X +/- the root) = 0 for both rrots. Multiplying these to get the equation.
   Q2 / Q10 / Q14 Page 147 ******** **********
8. I know how to solve **Simultaneous Equations by:**
   Focussing on eliminating the Y term
   Ensuring that the signs of the Y term are different and that the coefficient of the Y Terms is the same before cancelling to find X
   I know to sub my value of X into the first equation to find Y and that I can check my answer by subbing both values into the 2nd equation.
   Q8 / Q12 / Q20 / Q24 Page 278
9. I know that I can use simultaneous equations to find the intersection point of graphed lines.
   Q2 Page 281********
10. I know that I can use simultaneous equations to solve problems involving tickets etc.
    See example 2 Page 280
11. I know that I can use simultaneous equations to solve problems with stories
    Q11 / Q12 Page 282
12. know that I can use simultaneous equations to solve shapes or difference of numbers
    Q7 / Q10 / Q17 Page 283 ******** **********
13. I know how to work with **Algebraic Fraction** and that there are 2 types of problems i might be asked to work on:

Express as a single fraction (or simplest form) – can solve this like any fraction using the LCM technique using 'containers'

Q5 / Q20 Page 415

Solving Equations (i.e. with an '=' sign) involving fractions – Flat Pack Technique

We balance by placing a 1 under any terms with no denominator

We look for the LCM of all the denominators)

We write this LCM beside ALL terms

We look for any cancellations and multiply through to get a FLAT linear equation which we can then solve.

Q2 / Q16 / Q30 Page 416 ************************

14. I know how to solve problems involving fractions

    Q4 / Q10 Page 419

15. I know to do **Algebraic Division**

    Q4 / Q14 / Q24 Page 421 ************************

16. I know how to **Rearrange a Formula** to make any letter the subject of the formula

    I know that i must consider what is happening to the letter..

    If any term is being added or subtracted to the term with the letter then I will add/subtract (the opposite to what is in the formula) to both sides before I look for any cancellations

    If the term with the letter in it is being multiplied/divided by a number then I will multiply/divide (the opposite to what is in the formula) all terms in the formula by that number

    I will take care to:

    Factorise out the letter if it appears in more than 1 term.

    Flat pack any formulas with fractions in them before rearranging them

    Q2 / Q6 / Q8 / Q10 / Q14 Page 423 *****************

17. I know how **to Evaluate Formulae** by substituting in the variable values and solving.
18. I know how **to write Formulae**

    Q6 / Q9 / Q12 Page 425

19. I know how to **work with Formulae**

    Q7 / Q8 Page 425 ******************************

20. I know how to **write and work with formulae**

    Q10 / Q11 / Q14 Page 425 Q13 / Q15 Page 426 ******************

Maths Revision Worksheet: The Line Week 4 Revision 5 Problems per night

1. I know that the line formulae are on page 18 of my log book
2. I know how find the **distance** |AB| between 2 given points A and B (the length of the line between the 2 points)
   Q6 Page 206
3. I know how to find the **midpoint M** of a line given between 2 points.
   Q11 Page 206
4. I know that the slope of a line can be found by dividing the **RISE** by the **RUN**
5. I know how to determine the slope of a line plotted on a graph.
   Q2 Page 210 / Q9 Page 211
6. I know that the slope of a line tells us how much Y changes for 1 unit change in X
   i.e. a slope of '6' means that the Y co-ordinate increases by 6 units every time we increase the X by 1 unit
   i.e. a slope of '-6' means that the Y co-ordinate decreases by 6 units every time we increase the X by 1 unit.
7. I know how to find the **slope m** of a line given 2 points on the line using the slope formula.
   Q5 Page 201 **********************************
8. I know that parallel lines have equal slopes.
9. I know that the product of 2 lines that are perpendicular to each other is = -1
   i.e. $\mathbf{m_1 X m_2 = -1}$
10. I know that I am given the slope of a line that I can find the **slope any line perpendicular** to it by simply **changing its sign and finding its inverse using the x-1 key on my calculator.**
    Q6 Page 211
11. I know how to find the value of a variable given points and slopes.
    Q14 and Q15 Page 211
12. I know that the equation of the line can take 2 forms **ax+by+c = 0 and y = mx + c**
13. Given **1 point (x_1,y_1)** and the **slope m** of a line I can use the equation $\mathbf{y - y_1 = m(x - x_1)}$ to find an equation of a line in the form **ax + by + c = 0**
    (If given 2 points I know that I can use these 2 points to find the **slope m** and then use this slope with one of the 2 points find the equation of the line using **y – y1 = m(x – x1)**
    I know to always provide my line equation answer so that it begins with a positive x value.
    i.e. If my answer is **3y-6x = 7**
    I rewrite by multiplying all terms by -1 to make the x term positive to give
    -3y+6x= -7

And then rearrange to get

6x-3y = -7

And remember to take the -7 over to get...

6x-3y+7 = 0

Q1 and Q7 Page 214 ******** **********

14. I can rewrite an equation of a line given to me in the form **ax + by + c = 0 into the form y = mx + c** where **m is the slope** of the line and **c is the point on the y axis where the line intercepts the y axis.**
    This will alow me to find the slope m of the given line as well as the y axis intercept.

    Q1 and Q3 Page 216 / Q4 Page 217 / Q8 Page 217 / Q14 Page 218 ********

15. I can quickly graph a line by using the **'intercept method'** where
    I let x = 0 and find the corresponding y coordinate to find the first point (0,y)
    I let y = 0 and find the corresponding x coordinate to find the first point (x,0)
    I can plot/draw a perpendicular line to a line through a given point

    Q4 / Q5 Page 223

16. I know how to find the equation of a line which goes through a point and is parallel or perpendicular to another given line.
    Q4 Q9 Q10 Page219 220 ********
17. I know that lines in the form x = a are parallel to the y axis
18. I know that lines in the form y = b are parallel to the x axis
    Q2 Page 222
19. I know that lines with no independent term (c) go through the origin.
20. I know that I can verify if a point is on a line by substituting the x and y coordinate values into the equation.
    Q14 Page 224
21. I know that the point of intersection of 2 lines can be found by solving their equations simultaneously.
    Q1 / Q2 / Q12 Page 225 ********
22. I know how to find, by inspection, the other point on a line given 1 point and the mid - point of the line. i.e Given (2,3) and midpoint (5,9) the 3rd point is found by adding 3 to 5 for the x and by adding 6 to 9 for the y to give (8, 15) i.e. the differences
    Q16 and Q17 Page 207

23. I know how to interpret slopes from graphs.
    Q6 Page 229 / Q7 and Q8 Page 230 ********

Maths Revision Worksheet: Statistics Week 5 Revision 5 Problems per night

1. I know that when we look for an average value for a given set of data that we are looking for a **single or typical value** that best represents the values given.
2. I know that there are 3 types of average:
   The Mode: The most common value...**good for most common dress size etc**.
   The Median: The middle number in an ordered (in ascending order) set of data values.....**good for data that may not be closely grouped (salary example Page 124)**
   The Mean: The sum of the numbers in the set / the number of numbers in the set .... **good for closely grouped data (no outliers)**
3. I can reorder a list of numbers (given as a set of data) into ascending order and find the **mode** (most common) and the **median** value.
   Q3 / Q9 Page 119
4. I know how to find the **Mean** of a set of numbers
   Q2 / Q10 / Q15 Page 123 *************************
5. I know that **'outliers'** or **'extreme values'** can sometimes exist in a data set.
6. I know how to find the **mode, mean and median** for data displayed in a **Frequency Table**
   I know how to use the Mean = $\Sigma f(x) / \Sigma(f)$ formula to find the Mean
   Q2 / Q6 Page 129
7. I know how to find the **mode, mean and median** for data displayed in a **Grouped Frequency Table** by finding and using the **'mid-interval value'** to **as my values for x to 'estimate'** the mean.
   Q8 / Q9 / Q11 Page 131 ***************************
8. I know that the Range is found by subtracting the smallest value from the largest value in a given set of data values.
9. I know that the range shows how **'spread out'** a set of data is and is used to compare data where less spread out means more consistent data.
   Q3 / Q4 Page 133
10. I know how to find the **lower quartile Q_1 and upper quartile Q_3** values for an ordered set of data values.
    I know that an equal number of data values divide into 2 halves down the middle and that Q_1 can be found by finding the middle value of the first half of the data to the left and that Q3 can be found by finding the middle value of the second half of the data to the right.

I know that if I have an odd number of data I can cover the middle value and then find Q_1 by finding the middle value of the first half of the data to the left and Q_3 by finding the middle value of the second half of the data to the right.

I can use $Q_3 - Q_1$ to find the Inter Quartile Range of the data.

Q8 / Q9 / Q10 Page 134 **********************

11. I can interpret data presented in line plots and bar charts.
    Q10 page 251
12. I can generate a grouped frequency table and draw a histogram to represent the information.
    Q9 Page 251 / Q3 Page 259
13. I can use the angle supplied to calculate the size of the share of a pie chart.
    Q2 / Q3 Page 254 *****************************
14. I can use the supplied sector share value to find the angle of the sector.
    Q6 Page 255
15. I know that **0-5** means **≥ 0 and < 5 (greater than or equal to 0 and less than 5**) in a grouped frequency table and can interpret data presented in histograms.
    Q7 Page 259
16. I know what a **'positively skewed'**, **'negatively skewed'** and **'normal distributions'** look like and the type of data they represent. (age of learning to ride a bike / age of people entering nursing homes / height of basketball players)
17. I can plot a stem and leaf / back to back stem and leaf diagrams (with appropriate keys) and can find **Q_1, Q_3 and the Inter Quartile Range using $Q_3 - Q_1$** from the data.
    Q6 Page 266
18. I can interpret stem and leaf diagrams and calculate **Q_1, Q_3 and the Inter Quartile Range.**
    Q7 Page 266
19. I know that all graphs should have vertically labelled axis starting from 0 and should use the same width columns to represent data.
    Q4 Page 270 ******************************