GR 11 EQUATIONS

Remember you can always check your answer by subbing it into the LHS and RHS.

If they are the same, you have won the game!

LINEAR EQUATIONS

I Normal

🛛 <u>With brackets</u>

- *Variables to left
- *Numbers to right
- *Divide both sides by co-efficient

*Distribute out brackets

*Solve like normal

S <u>With Fractions</u>

- *Multiply both sides by LCD
- *You may need to factorise denominator first!
- *Solve like normal
- *Use brackets if there is more than 1 term in numerator or denominator.
- *Remember your restriction (den \neq 0)

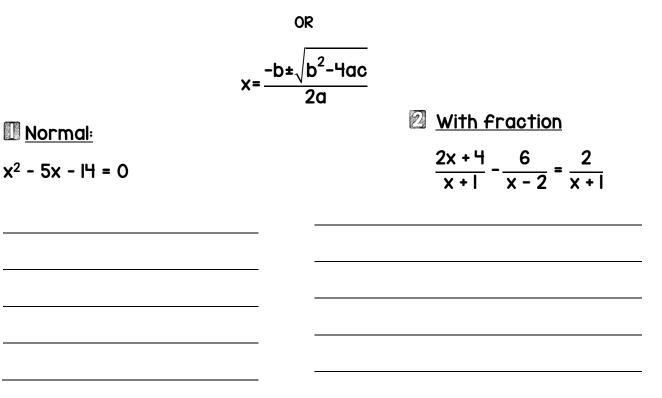
Solve for x:
$$\frac{8x + 1}{x} - \frac{6 + x}{2x} = \frac{2}{4x}$$

QUADRATIC EQUATIONS

*Make it = 0

*Factorise LHS using tools learnt in gr9

*Make each bracket = 0 & solve linear equation.



3 With root

- *Isolate root
- *Square both sides
- *Check answer!

$$\sqrt{\mathbf{x}+\mathbf{5}}-\mathbf{x}=-\mathbf{I}$$

🖽 <u>"k" method</u>

*Make part of the equation = k to simplify.

$$x^2 - 2x + 3 + \frac{2}{x^2 - 2x} = 0$$

Completing the square

- *Move the constant to RHS.
- *Make the co-efficient on $x^2 = 1$
- *Square half the co-efficient on \boldsymbol{x} and add it to both sides

$$-2x^2 + |2x - || = 0$$

LINEAR INEQUALITIES

- *Sign changes when we move a term across the sign.
- *Sign changes direction when we multiply/divide by a negative number.
- * An open dot or round bracket means the number is excluded.
- *A closed dot or square bracket means the number is included.

2x + 8 < 0

 \bigcirc -5 < I - 2x \leq 3

QUADRATIC INEQUALITIES

*Find critical values

*Test numbers on either side to see where it meets the condition.

 x^2 - x - $6 \ge 0$

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SIMULTANEOUS EQUATIONS

<u>Substitution</u>

- *Get 1 variable in terms of the other.
- *Sub it into the OTHER equation.

x + 2y = 5 2y² - xy - 4x² = 8

Elimination (only for linear)

*Multiply/divide 1 equation by a factor.

* Add/subtract the equations to eliminate 1 variable.

NATURE OF ROOTS

*A root is where the quadratic graph would cut the x-axis.

Discriminant (Δ) = b² - 4ac

If Δ is:	Roots are:
A perfect square	Rational
0	Equal
Greater than O	Unequal
Non-perfect square	Irrational
Negative	Non-real