

$$3^x = \frac{1}{9}$$

$$3^x = 3^{-2}$$

$$\therefore x = -2$$

✓ common factor

✓ simplification

✓ change to base 3

✓ answer

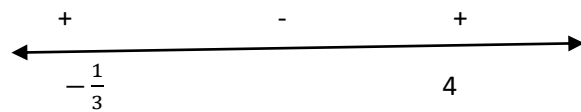
4. Inequalities

To get the critical values, the right hand side must be = 0 i.e. **standard form**

Remember: When dividing or multiplying by a(-), the inequality sign changes

The solution must be in the context of inequality at all times

Example, solve for x: $(3x + 1)(x - 4) < 0$



$$\therefore -\frac{1}{3} < x < 4$$

✓ Method

✓ End points

✓ Correct notation

5. Simultaneous equations

$$y + 7 = 2x \text{ and } x^2 - xy + 3y^2 = 15$$

$$y + 7 = 2x$$

$$y = 2x - 7 \dots \dots (1)$$

$$x^2 - xy + 3y^2 = 15$$

Substitute (1) in (2)

$$x^2 - x(2x - 7) + 3(2x - 7)^2 = 15$$

$$x^2 - 2x^2 + 7x + 3(4x^2 - 28x + 49) = 15$$

$$x^2 - 2x^2 + 7x + 12x^2 - 84x + 147 - 15 = 0$$

$$11x^2 - 77x + 132 = 0$$

$$x^2 - 7x + 12 = 0$$

$$(x - 3)(x - 4) = 0$$

$$x = 3 \text{ or } x = 4$$

$$y = 2(3) - 7 \quad y = 2(4) - 7$$

✓ $y = 2x - 7$

✓ substitution

✓ standard form

✓ factorisation

✓ x-values

✓ y-values