Algebra x^3

$\frac{x^2-36}{x} = \frac{x+6}{x-6}$ $x \neq 0$

$x \neq 6$

$(x-6)\,(x+6).\,(x-6) = x(x+6)$

Solution, $x = -6$

$(x-6)^2 = x$

$x^2 - 12x + 36 = x$ | $x = -6$ ---------- 1

$x^2 - 13x + 36 = 0$ | $x = 4$ ----------2

$(x-4).\,(x-9) = 0$ | $x = 9$ ----------3

$(x-2) = (x^2-4)\,(x+2)$

$x = +2$ is a solution

Find the others

$\frac{x^2-144}{x} = \frac{x+12}{x-12}$ $x \neq 0$, $x \neq 12$

$x = -12$ is a solution

$\frac{x-12}{x} = \frac{1}{x-12}$

$(x-12)^2 - x = 0$ | $x = -12$ ----------1

$x^2 - 25x + 144 = 0$ | $x = 9$ ----------2

$(x-16).\,(x-9) = 0$ | $x = 16$ ----------3