The following table gives some hints on how to solve an equation for a variable x. The quantities X, Y, Z, and W match with any expression that involves x and the quantities a and b match with any number (or constant that doesn't depend on x). Sometimes you'll need to do some algebra (divide both sides by a nonzero number, factor, or other such things) to make the match.

Rule	Replace	With	Condition(s)
1	$a = b$ **and** $a \neq b$	$\varnothing$	(none)
2	$0x = 1$	$\varnothing$	(none)
3	$0x = 0$	**R**	(none)
4	$ax = b$ **and** $a \neq 0$	$x = \dfrac{b}{a}$	(none)
5	$ax^2 + bx + c = 0$ **and** $a \neq 0$	$x = \dfrac{-b - \sqrt{b^2 - 4ac}}{2a}$ **or** $x = \dfrac{-b + \sqrt{b^2 - 4ac}}{2a}$	$b^2 - 4ac \geq 0$
6	$XY = 0$	$X = 0$ **or** $Y = 0$	(none)
7	$\dfrac{X}{Y} = 0$	$X = 0$	$Y \neq 0$
8	$\dfrac{W}{X} = \dfrac{Y}{Z}$	$WZ = XY$	$X \neq 0$ **and** $X \neq 0$
9	$X^2 = Y$	$X = -\sqrt{Y}$ **or** $X = \sqrt{Y}$	$Y \geq 0$
10	$\lvert X \rvert = Y$	$X = Y$ **or** $X = -Y$	$Y \geq 0$
11	$\sqrt{X} = Y$	$X = Y^2$	$Y \geq 0$
12	$\exp(X) = a$	$X = \ln(a)$	$a > 0$
13	$a^X = b$ **and** $a > 0$ **and** $a \neq 1$ **and** $b > 0$	$X = \dfrac{\ln(b)}{\ln(a)}$	(none)
14	$\ln(X) = a$	$X = \exp(a)$	
15	$\cos(X) = a$	$X = 2\pi k + \cos^{-1}(a)$ **or** $X = 2\pi k - \cos^{-1}(a)$	$-1 \leq a \leq 1$ **and** $k \in \mathbf{Z}$
16	$\sin(X) = a$	$X = 2\pi k + \sin^{-1}(a)$ **or** $X = 2\pi k + \pi - \sin^{-1}(a)$	$-1 \leq a \leq 1$ **and** $k \in \mathbf{Z}$