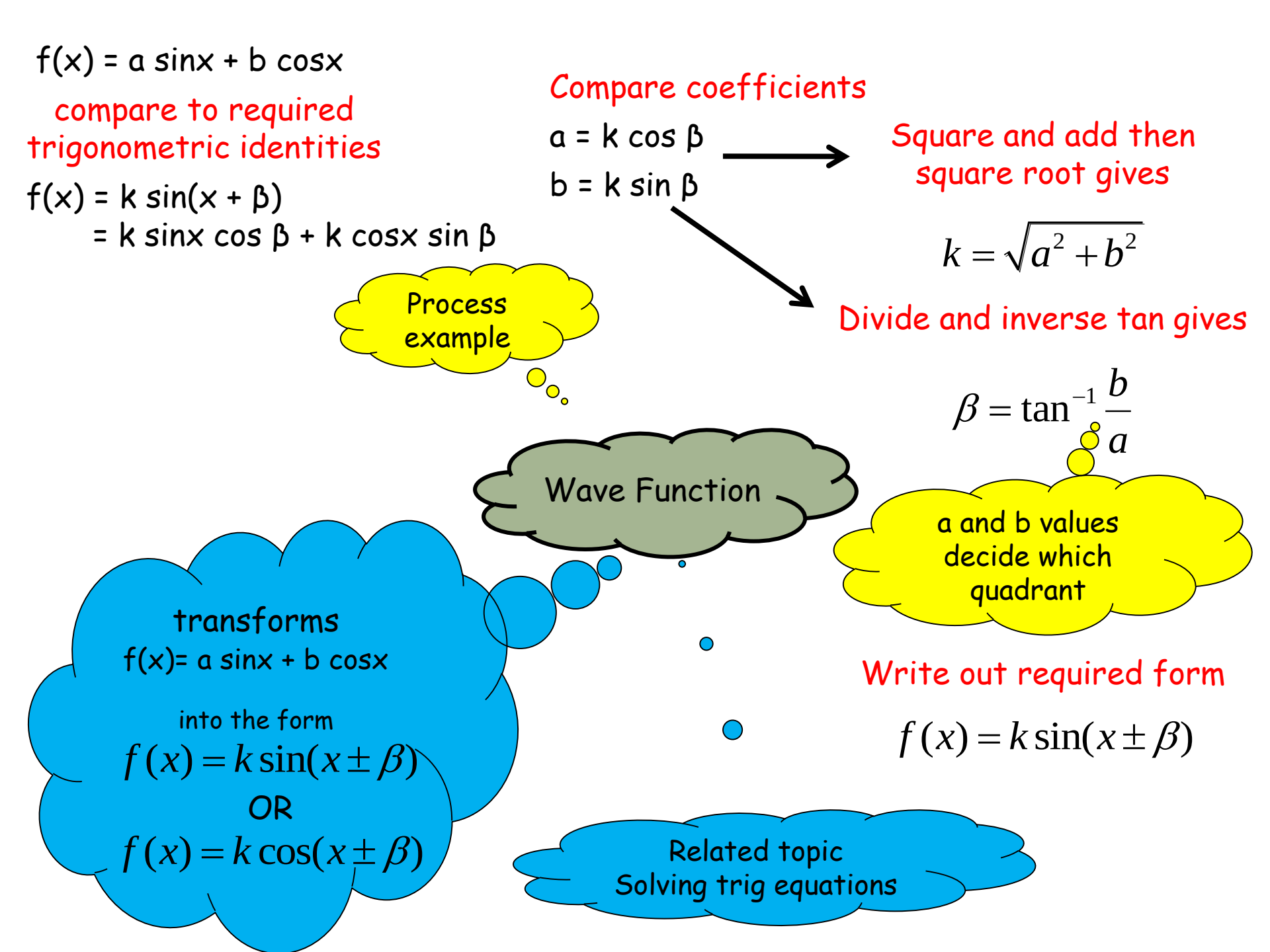
f(x) = a sinx + b cosx
compare to required trigonometric identities
f(x) = k sin(x + β)
= k sinx cos β + k cosx sin β
Compare coefficients
a = k cos β
b = k sin β
Square and add then square root gives
$k = \sqrt{a^2 + b^2}$
Divide and inverse tan gives
$\beta = \tan^{-1}\frac{b}{a}$
Process example
Wave Function
a and b values decide which quadrant
transforms
f(x)= a sinx + b cosx
into the form
$f(x) = k\sin(x \pm \beta)$
OR
$f(x) = k\cos(x \pm \beta)$
Write out required form
$f(x) = k\sin(x \pm \beta)$
Related topic
Solving trig equations