

Algebra /

Finding the roots of a quadratic equation with leading coefficient...

$$\begin{aligned}
 4w^2 &= 5w + 6 \\
 &\quad -5w \quad -6 \\
 4w^2 - 5w - 6 &= 0 \\
 (4w + 3)(w - 2) &= 0 \\
 (4w + 3)(w - 2) &= 0 \\
 4w + 3 &= 0 & w - 2 &= 0 \\
 -3 & \quad -3 & +2 & \quad +2 \\
 \frac{4w}{4} &= \frac{-3}{4} & w &= 2 \\
 w &= -\frac{3}{4} & w &= 2
 \end{aligned}$$

Handwritten work showing the process of finding the roots of the quadratic equation $4w^2 = 5w + 6$. The equation is rearranged to $4w^2 - 5w - 6 = 0$. The factors $(4w + 3)(w - 2) = 0$ are identified. The roots are found by setting each factor equal to zero: $4w + 3 = 0$ gives $w = -\frac{3}{4}$, and $w - 2 = 0$ gives $w = 2$. The roots are circled in blue.