When the product of two (or more) numbers is zero, then at least one of them must be zero, i.e., if \( ab = 0 \) then \( a = 0 \) or \( b = 0 \).

**EXERCISE**

1. Solve for the unknown using the Null Factor law:
   - \( a \): \( 3x = 0 \)
   - \( b \): \( 5y = 0 \)
   - \( c \): \( a \times 8 = 0 \)
   - \( d \): \( b \times -2 = 0 \)
   - \( e \): \( -7y = 0 \)
   - \( f \): \( ab = 0 \)
   - \( g \): \( 2xy = 0 \)
   - \( h \): \( abc = 0 \)
   - \( i \): \( x^2 = 0 \)
   - \( j \): \( a^2 = 0 \)
   - \( k \): \( pqr = 0 \)
   - \( l \): \( a^2b = 0 \)

2. Solve for \( x \) using the Null Factor law:
   - \( a \): \( x(x - 5) = 0 \)
   - \( b \): \( 2x(x + 3) = 0 \)
   - \( c \): \( (x + 1)(x - 3) = 0 \)
   - \( d \): \( 3x(7 - x) = 0 \)
   - \( e \): \( -2x(x + 1) = 0 \)
   - \( f \): \( 4(x + 6)(2x - 3) = 0 \)
   - \( g \): \( x^2 = 0 \)
   - \( h \): \( 4(5 - x)^2 = 0 \)
   - \( i \): \( -3(3x - 1)^2 = 0 \)

To use the Null Factor law when solving equations, we must have one side of the equation equal to zero.

**STEPS FOR SOLVING QUADRATIC EQUATIONS**

*Step 1:* If necessary rearrange the equation with one side being zero.

*Step 2:* Fully factorise the other side (usually the LHS).

*Step 3:* Use the Null Factor law.

*Step 4:* Solve the resulting linear equations.

*Step 5:* Check at least one of your solutions.

3. Solve for \( x \):
   - \( a \): \( x^2 - 7x = 0 \)
   - \( b \): \( x^2 - 5x = 0 \)
   - \( c \): \( x^2 = 8x \)
   - \( d \): \( x^2 = 4x \)
   - \( e \): \( 3x^2 + 6x = 0 \)
   - \( f \): \( 2x^2 + 5x = 0 \)
   - \( g \): \( 4x^2 - 3x = 0 \)
   - \( h \): \( 4x^2 = 5x \)
   - \( i \): \( 3x^2 = 9x \)

4. Solve for \( x \):
   - \( a \): \( x^2 - 1 = 0 \)
   - \( b \): \( x^2 - 9 = 0 \)
   - \( c \): \( (x - 5)^2 = 0 \)
   - \( d \): \( (x + 2)^2 = 0 \)
   - \( e \): \( x^2 + 3x + 2 = 0 \)
   - \( f \): \( x^2 - 3x + 2 = 0 \)
   - \( g \): \( x^2 + 5x + 6 = 0 \)
   - \( h \): \( x^2 - 5x + 6 = 0 \)
   - \( i \): \( x^2 + 7x + 6 = 0 \)
   - \( j \): \( x^2 + 9x + 14 = 0 \)
   - \( k \): \( x^2 + 11x = -30 \)
   - \( l \): \( x^2 + 2x = 15 \)
   - \( m \): \( x^2 + 4x = 12 \)
   - \( n \): \( x^2 = 11x - 24 \)
   - \( o \): \( x^2 = 14x - 49 \)
5 Solve for x:
   a $x^2 + 9x + 14 = 0$
   b $x^2 + 11x + 30 = 0$
   c $x^2 + 2x = 15$
   d $x^2 + x = 12$
   e $x^2 + 6 = 5x$
   f $x^2 + 4 = 4x$
   g $x^2 = x + 6$
   h $x^2 = 7x + 60$
   i $x^2 = 3x + 70$
   j $10 - 3x = x^2$
   k $x^2 + 12 = 7x$
   l $9x + 36 = x^2$

6 Solve for x:
   a $2x^2 + 2 = 5x$
   b $3x^2 + 8x = 3$
   c $3x^2 + 17x + 20 = 0$
   d $2x^2 + 5x = 3$
   e $2x^2 + 5 = 11x$
   f $2x^2 + 7x + 5 = 0$
   g $3x^2 + 13x + 4 = 0$
   h $5x^2 = 13x + 6$
   i $2x^2 + 17x = 9$
   j $2x^2 + 3x = 5$
   k $3x^2 + 2x = 8$
   l $2x^2 + 9x = 18$

7 Solve for x:
   a $6x^2 + 13x = 5$
   b $6x^2 = x + 2$
   c $6x^2 + 5x + 1 = 0$
   d $21x^2 = 62x + 3$
   e $10x^2 + x = 2$
   f $10x^2 = 7x + 3$

8 Solve for x by first expanding brackets and then equating to zero:
   a $x(x + 5) + 2(x + 6) = 0$
   b $x(1 + x) + x = 3$
   c $(x - 1)(x + 9) = 8x$
   d $3x(x + 2) - 5(x - 3) = 17$
   e $4x(x + 1) = -1$
   f $2x(x - 6) = x - 20$