Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$

In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$

In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1.

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$

In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$

In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do?

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$

Example: Write the quadratic in factored form:

 $2x^2 + 4x - 6 = ?$

In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do?

Notice, we can factor out the 2 and get:

$$2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$$

Now we can factor:

$$(x^2 + 2x - 3) = (x - r_1) \cdot (x - r_2)$$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula) gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ We can find the roots to be:

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula) gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula) gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$ So, we get the factored form:

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula) gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$ So, we get the factored form: $x^{2} + 4x - 21 = (x - (-3)) \cdot (x - 1)$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$ So, we get the factored form: $x^{2} + 4x - 21 = (x - (-3)) \cdot (x - 1)$ Bringing this back to our original quadratic, we have:

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^2 + 4x - 6 = 2(x^2 + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$ So, we get the factored form: $x^{2} + 4x - 21 = (x - (-3)) \cdot (x - 1)$ Bringing this back to our original quadratic, we have: $2x^{2} + 4x - 6 = 2(x^{2} + 2x - 3)$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^{2} + 4x - 6 = 2(x^{2} + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$ So, we get the factored form: $x^{2} + 4x - 21 = (x - (-3)) \cdot (x - 1)$ Bringing this back to our original quadratic, we have: $2x^{2} + 4x - 6 = 2(x^{2} + 2x - 3) = 2(x - (-3)) \cdot (x - 1)$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^{2} + 4x - 6 = 2(x^{2} + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$ So, we get the factored form: $x^{2} + 4x - 21 = (x - (-3)) \cdot (x - 1)$ Bringing this back to our original quadratic, we have: $2x^{2} + 4x - 6 = 2(x^{2} + 2x - 3) = 2(x - (-3)) \cdot (x - 1)$ Notice that in our final form, we have: $2x^{2} + 4x - 6 = 2(x - (-3)) \cdot (x - 1)$

Example: Write the quadratic in factored form: $2x^2 + 4x - 6 = ?$ In the past, we would have used the factored form: $(x - r_1) \cdot (x - r_2)$ But we could do that because our coefficient of x^2 was just 1. And now our coefficient of x^2 is 2 So, what do we do? Notice, we can factor out the 2 and get: $2x^{2} + 4x - 6 = 2(x^{2} + 2x - 3)$ Now we can factor: $(x^{2}+2x-3) = (x-r_{1}) \cdot (x-r_{2})$ • The Quadratic Formula gives us a way to find the roots r_1 and r_2 of $x^{2} + 2x - 3$ • We can find the roots to be: $r_1, r_2 = -3, 1$ So, we get the factored form: $x^{2} + 4x - 21 = (x - (-3)) \cdot (x - 1)$ Bringing this back to our original quadratic, we have: $2x^{2} + 4x - 6 = 2(x^{2} + 2x - 3) = 2(x - (-3)) \cdot (x - 1)$ Notice that in our final form, we have: $2x^{2} + 4x - 6 = 2(x - (-3)) \cdot (x - 1)$ Where 2 is the coefficient of x^2 and $r_1, r_2 = -3, 1$ are the roots.

In general, we can write any quadratic in factored form: $ax^2 + bx + c = a(x - r_1) \cdot (x - r_2)$

In general, we can write any quadratic in factored form: $ax^2 + bx + c = a(x - r_1) \cdot (x - r_2)$

Where r_1 and r_2 are given by the Quadratic Formula:

In general, we can write any quadratic in factored form: $ax^2 + bx + c = a(x - r_1) \cdot (x - r_2)$

Where r_1 and r_2 are given by the Quadratic Formula:

$$r_{1,2} = \frac{-(b) \pm \sqrt{(b)^2 - 4ac}}{2a}$$

In general, we can write any quadratic in factored form: $ax^2 + bx + c = a(x - r_1) \cdot (x - r_2)$

Where r_1 and r_2 are given by the Quadratic Formula:

$$r_{1,2} = \frac{-(b) \pm \sqrt{(b)^2 - 4ac}}{2a}$$

Using this, we can put any quadratic into Factored Form!