1 Turning equations into quadratics

When there are three terms in an equation, we can often turn them into a quadratic, where the subject is not x but another expression that we substitute in.
For example, $e^{4x} - 5e^{2x} + 6 = 0$ can be solved by making it a quadratic in terms of e^{2x}.
$u = e^{2x}$
$u^2 - 5u + 6 = 0$
$u = 2, 3$
Then we just back-substitute and solve:
$e^{2x} = 2$
$2x = \ln 2$
$x = \frac{\ln 2}{2}$
$e^{2x} = 3$
$2x = \ln 3$
$x = \frac{\ln 3}{2}$
If all three terms contain a variable, we can also divide the equation through by something to turn one of those into a constant, enabling us to then solve it as a quadratic.
For example, $3(2^{3x}) - 11(2^{2x}) - 2^{x+2} = 0$
If we divide each term by a common factor of 2^x, the equation changes to:
$\frac{3(2^{3x})}{2^x} - \frac{11(2^{2x})}{2^x} - \frac{2^{x+2}}{2^x} = 0$
$3(2^{2x}) - 11(2^x) - 2^2 = 0$
We can now make the substitution $u = 2^x$ to solve the equation:
$3u^2 - 11u - 4 = 0$
$u = -\frac{1}{3}, 4$
Since 2^x can clearly never be negative, we can disregard the first solution.
$2^x = 4$
$x = 2$

Questions

1. Solve $2^x + 4^x = 24$
2. Solve $4^x + 6^x = 9^x$
3. Solve $8(9^x) + 3(6^x) - 81(4^x) = 0$
4. Solve $25^x + 2(15^x) - 24(9^x) = 0$