2115 Utveckla och förenkla

a) $2x(x+y) - 2y(x-y) = 2x^2 + 2xy - 2yx + 2y^2$

$= 2x^2 + 2xy - 2xy + 2y^2 = 2x^2 + 2y^2$

b) $2\left(x + \frac{1}{2}\right)^2 - 2\left(x - \frac{1}{2}\right)^2 = 2\left(x^2 + 2x \cdot \frac{1}{2} + \left(\frac{1}{2}\right)^2\right) - 2\left(x^2 - 2x \cdot \frac{1}{2} + \left(\frac{1}{2}\right)^2\right)$

$= 2\left(x^2 + x + \frac{1}{4}\right) - 2\left(x^2 - x + \frac{1}{4}\right) = 2x^2 + 2x + \frac{1}{2} - 2x^2 + 2x - \frac{1}{2}$

$= 4x$

c) $2x(x+y)^2 - 2y(x-y)^2$

$= 2x(x^2 + 2xy + y^2) - 2y(x^2 - 2xy + y^2)$

$= 2x^3 + 4x^2y + 2xy^2 - 2yx^2 + 4xy^2 - 2y^3$

$= 2x^3 + 2x^2y + 6xy^2 - 2y^3$