1.2.1

a)

$(a + 2b) \cdot (c - 3a) = ac - 3a^2 + 2bc - 6ab$

Aber:

$a + 2b \cdot c - 3a = -2a + 2bc$

$18 \cdot 22 = (20 + 2)(20 - 2) = 400 - 4 = 396$

$$\frac{4a^2 + 12ab + 9b^2}{4a^2 - 9b^2} = \frac{(2a + 3b)^2}{(2a + 3b)(2a - 3b)} = \frac{2a + 3b}{2a - 3b}$$

$$\frac{\sqrt{x} - \sqrt{y}}{\sqrt{x} + \sqrt{y}} = \frac{(\sqrt{x} - \sqrt{y})(\sqrt{x} - \sqrt{y})}{(\sqrt{x} + \sqrt{y})(\sqrt{x} - \sqrt{y})} = \frac{(\sqrt{x} - \sqrt{y})^2}{x - y} = \frac{x - 2\sqrt{xy} + y}{x - y}$$

b)

$(a + b)^4$

$$= \binom{4}{0} b^4 + \binom{4}{1} a^1 b^3 + \binom{4}{2} a^2 b^2 + \binom{4}{3} a^3 b^1 + \binom{4}{4} a^4$$

$$= b^4 + 4ab^3 + 6a^2 b^2 + 4a^3 b + a^4$$

c)

$$\frac{ax + ay}{x^2 - y^2} = \frac{a(x + y)}{(x + y)(x - y)} = \frac{a}{x - y}$$

1.2.2

a)

$2x^2 - 4x = 6 \rightarrow x^2 - 2x = 3 \rightarrow x^2 - 2x - 3 = 0$

$$\frac{2}{2} \pm \sqrt{\frac{4}{4} + 3}$$

$x_1 = -1$

$x_2 = 3$