

$$1) \quad b^2 x + b^2 = b^4 + b x$$

$$b^2 x - b x = b^4 - b^2$$

$$b x (b - 1) = b^2 (b^2 - 1)$$

$$b (b - 1) x = b^2 (b + 1) (b - 1)$$

$$\text{Se } b \neq 0 \wedge b \neq 1$$

$$x = \frac{b^2 (b + 1) \cancel{(b - 1)}}{b \cancel{(b - 1)}} = b(b + 1)$$

$$\text{Se } b = 0 \quad 0 x = 0 \quad S = \mathbb{R}$$

$$\text{Se } b = 1 \quad 0 x = 0 \quad S = \mathbb{R}$$

$$2) \quad (x + 2)^2 + b(a - 3) < \overset{A}{\underline{(x + a + 2)}} \overset{B}{\underline{(x + a - 2)}}$$

$$x^2 + 4x + 4 + 4a - 12 < (x + a)^2 - 4$$

$$\cancel{x^2} + 4x + 4 + 4a - 12 < \cancel{x^2} + 2ax + a^2 - 4$$

$$4x - 2ax < -4 - 4a + 12 + a^2 - 4$$

$$2x(2 - a) < a^2 - 4a + 4$$

$$\underline{2(2 - a)x} < (a - 2)^2$$

Se $2-a > 0$ cioè se $a < 2$,

$$x < \frac{(a+2)^2}{2(2-a)} \quad | \quad x < \frac{(2-a)^2}{2(2-a)}$$

$$x < \frac{2-a}{2}$$

Se $a > 2$

$$x > \frac{(a-2)^2}{2(2-a)} \quad | \quad x > \frac{2-a}{2}$$

$$3) a(x-a-1) + bx(2+x) - 3bx = 2(x-1) + -2bx(x-1)$$

$$ax - a^2 - a + 2bx + bx^2 - 3bx = 2x - 2 - 2bx + 2bx^2$$

$$ax - 2x = a^2 + a - 6$$

$$(a-2)x = (a+3)(a-2)$$

Se $a \neq 2$, allora $x = a+3$

Se $a = 2$, allora $0x = 0 \quad S = \mathbb{R}$

$$4) 3x - a(x-a) < (a-1)(a+1) + a + 4$$

$$3x - ax + \cancel{a^2} < \cancel{a^2} - 1 + a + 4$$

$$(3-a)x < a+3$$

$$\text{Se } 3-a=0 ; a=3$$

$$0x < 6 \quad S = \mathbb{R}$$

$$\text{Se } 3-a > 0 ; a < 3$$

$$x < \frac{a+3}{3-a}$$

$$\text{Se } 3-a < 0 ; a > 3$$

$$x > \frac{3+a}{3-a}$$