Equazioni letterali

$ax = 3 \qquad a \in \mathbb{R}$

$a = 1 \longrightarrow x = 3$

$a = 2 \longrightarrow 2x = 3$

$x = 3 \Longrightarrow \underline{3a = 3}$

1) $2bx = 2b - b^2$

$2bx = b(2-b)$

a) Se $b = 0$, si ha:

$0 = 0 \qquad S = \mathbb{R}$

b) Se $b \neq 0$, allora:

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

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

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

a) Se $b \neq 0$ e $b \neq 1$, si ha:

$x = \dfrac{\cancel{b-1}}{b\cancel{(b-1)}} = \dfrac{1}{b}$

b) Se $b = 0$, si ha:

$0x = -1 \qquad S = \emptyset$

c) Se $b = 1$, si ha:

$0x = 0 \qquad S = \mathbb{R}$

3) $x + a + (a-1)^2 = a[4a - (a - 2x)]$

$x + a + a^2 - 2a + 1 = 4a^2 - a^2 + 2ax$

$x - 2ax = 2a^2 + a - 1$

$x\underline{(1-2a)} = (a+1)(2a-1)$

	2	1	-1
-1		-2	1
	2	-1	//

a) Se $1-2a \neq 0$, cioè se $a \neq 1/2$, si ha:

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

b) Se $a = 1/2$, si ha:

$$0x = 0 \qquad S = \mathbb{R}$$

4) $(a-3)x = 2b-4$

a) Se $a=3$, si ha:

$$0x = 2b-4$$

Se $b=2$ → $S=\mathbb{R}$

Se $b \neq 2$ → $S=\emptyset$

b) Se $a \neq 3$, si ha:

$$x = \frac{2b-4}{a-3}$$

- Se $a = 3 \wedge b = 2$ $\quad S = \mathbb{R}$
- Se $a = 3 \wedge b \neq 2$ $\quad S = \emptyset$
- Se $a \neq 3$ $\quad S = \left\{ \frac{2b-4}{a-3} \right\}$

Disequazioni letterali

1) $(3x-6)a \geq 3(2a-x)$

$$3ax - 6a \geq 6a - 3x$$

$$3ax + 3x \geq 6a + 6a$$

$$3(a+1)x \geq 12a$$

$$(a+1)x \geq 4a$$

a) Se $a = -1$, si ha:

$$0x \geq -4 \qquad S = \mathbb{R}$$

b) Se $a+1 > 0$, cioè se $a > -1$, si ha

$$x \geq \frac{4a}{a+1}$$

c) Se $a < -1$, do kemi:

$$x \le \frac{4a}{a+1}$$

2) $x(b-2)(b+2) - 3(1-2b) + 3x < x(b^2-1) + x(2b-1)$

$\cancel{b^2x} - \cancel{4x} - 3 + 6b + \cancel{3x} < \cancel{b^2x} - \cancel{x} + 2bx - x$

$x - 2bx < 3 - 6b$

$(1-2b)x < 3(1-2b)$

a) Se $b = 1/2$, do kemi:

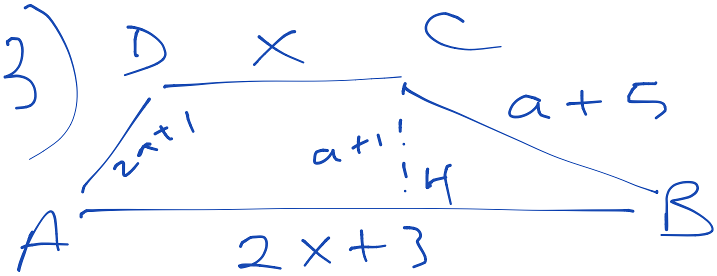
$0x < 0 \qquad S = \varnothing$

b) Se $\boxed{1-2b > 0}$, pra se $b < 1/2$, do kemi:

$$x < \frac{3\cancel{(1-2b)}}{\cancel{1-2b}}, \quad x < 3$$

c) Se $\boxed{1-2b < 0}$, pra se $b > 1/2$, do kemi:

$$x > 3$$

3) 

$A \geq 4a\ cm^2$

$$A = \frac{(\overline{DC}+\overline{AB})\cdot \overline{CH}}{2} =$$

$$= \frac{(x+2x+3)\cdot(a+1)}{2} =$$

$$= \frac{(3x+3)(a+1)}{2} \geq 4a$$

$$3ax+3x+3a+3 \geq 8a$$

$$3x(a+1) \geq 5a-3$$

a) Non si discute il caso $a=-1$ perché non compatibile con le condizioni geometriche

$$AD = 2(-1)+1 = -1 \quad \text{imp.}$$

b) Per ragioni analoghe non si discute il caso $a<-1$.

c) Se $a > -1$, si ha:

$$x > \frac{5a-3}{3(a+1)}$$

Se $A = 4a \Rightarrow x = \dfrac{5a-3}{3(a+1)}$

$$P = x + a + 5 + 2x + 3 + 2a + 1 =$$

$$= 3x + 3a + 9$$

$$P\left(\frac{5a-3}{3(a+1)}\right) = \cancel{3}\,\frac{(5a-3)}{\cancel{3}(a+1)} + 3a + 9 =$$

$$= \frac{5a-3}{a+1} + 3a + 9 = \frac{5a-3+3a^2+3a+9a+9}{a+1} =$$

$$= \frac{3a^2+17a-6}{a+1}$$