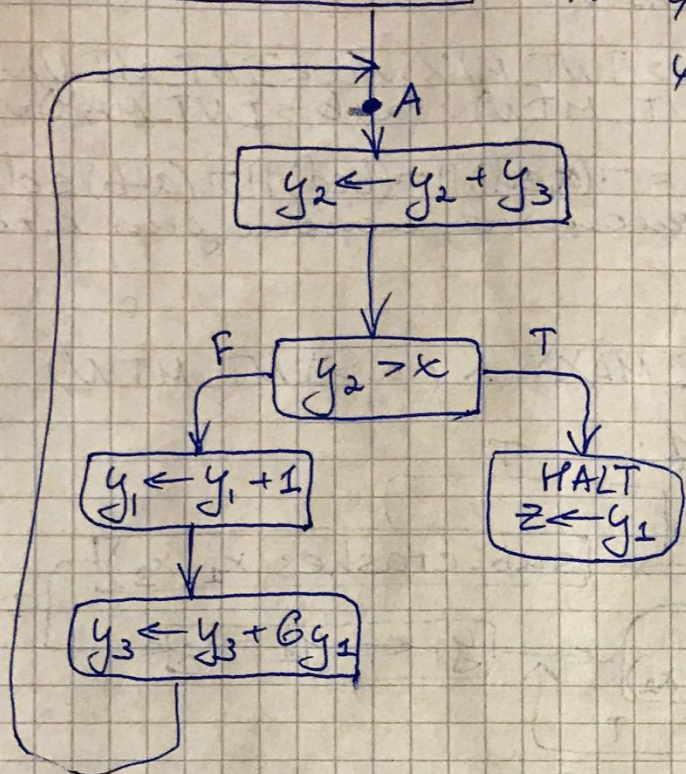


START  
 $(y_1, y_2, y_3) \leftarrow (0, 0, 1)$

$$\mathcal{D}x = \mathcal{D}y_1 = \mathcal{D}y_2 = \mathcal{D}y_3 = \mathcal{D}z = \mathbb{Z}$$

$$T: \varphi(x) \equiv x \geq 0$$

$$\psi(x, z) \equiv z^3 \leq x < (z+1)^3$$



1) Выберем  $m, A \Rightarrow$  или базовых или:

1.  $S-A, R_{S-A} = T$   
 $\Gamma_{S-A} = (x, 0, 0, 1)$

2.  $A-A, R_{A-A} = y_2 + y_3 \leq x$   
 $\Gamma_{A-A} = (x, y_1 + 1, y_2 + y_3, y_3 + 6y_1 + 6)$

3.  $A-H, R_{A-H} = y_2 + y_3 > x$   
 $\Gamma_{A-H} = (x, y_1, y_2, y_3)$

2)  $S-A: x \geq 0 \Rightarrow P_A(x, 0, 0, 0) \quad (\checkmark)$

$A-A: x \geq 0 \wedge P_A(x, y_1, y_2, y_3) \wedge (y_2 + y_3 \leq x) \Rightarrow$   
 $P_A(x, y_1 + 1, y_2 + y_3, y_3 + 6y_1 + 6)$

$A-H: x \geq 0 \wedge P_A(x, y_1, y_2, y_3) \wedge (y_2 + y_3 > x) \Rightarrow$   
 $\Rightarrow y_1^3 \leq x < (y_1 + 1)^3$

Подберем  $P_A$

$\supset P_A$  содержит следующее  $y_1^3 \leq x$

$A-A: \frac{y_1^3 \leq x}{P} \quad \frac{y_2 + y_3 \leq x}{R}$

$P \left[ \underbrace{y_1^3}_{y_2} + \underbrace{3y_1^2 + 1}_{y_3} \leq x \right]$

$A-H: \frac{y_2 + y_3 > x}{R} \quad \frac{y_1^3 \leq x}{P}$

$\vee \left[ \underbrace{y_1^3 + 3y_1^2 + 1}_{y_1^3 \leq x} > x \right]$

Предназначим  $P_A = (y_1^3 \leq x) \wedge (y_2 = y_1^3) \wedge (y_3 = 3y_1^2 + 1)$

3)  $S-A: x \geq 0 \Rightarrow P_A(x, 0, 0, 1) = x \geq 0 \wedge (0 = 0) \wedge (1 = 1) =$   
 $= \{x \geq 0\} = T$



$$A-A: \quad x \geq 0 \wedge (y_1^3 \leq x) \wedge (y_2 = y_1^3) \wedge (y_3 = 3y_1 + 3y_1^2 + 1) \wedge (y_2 + y_3 \leq x)$$

$$\cancel{(y_1^3 \leq x)} \Rightarrow y_2 + y_3 = (y_1 + 1)^3 \quad \cancel{(y_1 + 1)^3 \leq x} \quad \textcircled{1}$$

$$\Rightarrow (y_1 + 1)^3 \leq x \quad \textcircled{2}$$

$$\Rightarrow y_3 + 6y_1 + 6 = 3y_1 + 3 + 3y_1^2 + 6y_1 + 3 + 1 \Rightarrow$$

$$\Rightarrow y_3 + 6y_1 + 6 = 3y_1 + 3 + 3(y_1^2 + 2y_1 + 1) + 1 \Rightarrow$$

$$\Rightarrow y_3 + 6y_1 + 6 = 3(y_1 + 1) + 3(y_1 + 1)^2 + 1 \quad \textcircled{3}$$

$$\Rightarrow \begin{cases} \textcircled{1} \\ \textcircled{2} \end{cases} \textcircled{3} \Rightarrow P_A = (y_1^3 \leq x) \wedge (y_2 = y_1^3) \wedge (y_3 = 3y_1 + 3y_1^2 + 1)$$

$$A-H: \quad x \geq 0 \wedge (y_1^3 \leq x) \wedge (y_2 = y_1^3) \wedge (y_3 = 3y_1 + 3y_1^2 + 1) \wedge (y_2 + y_3 \leq x)$$

$$\Rightarrow y_1^3 \leq x$$

$$\Rightarrow y_2 + y_3 = (y_1 + 1)^3 > x$$



27D.