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Problem Solving: Set B

Bronze:

a) 4^{x+2}

$2^{2(x+2)}$

$\cdot\ 2^{2x+4}$

$\therefore x = 2x+4$

b) $4^{x+2} = 32$

$\downarrow$

~~$x = 2x+4$~~

$2^{2x+4} = 32$

$2^5 = 32$

$2x+4 = 5$

$2x = 1$

$x = 1/2$

Silver:

a) $4x-1 = y \rightarrow y = 4^{x-1}$

$(4x-1)^2 = y^2$

$y^2 - 6y + 8 = 0$

b) $(4x-1)^2 - 6(4x-1) + 8 = 0$

$16x^2 - 8x + 1 - 24x + 6 + 8 = 0$

$16x^2 - 32x + 15 = 0$

$x = 3/2$ or $x = 2$

Gold:

$(9^{x-1})^2 - 30(9^{x-1}) + 81 = 0 \Rightarrow y = 9^{x-1} \rightarrow y^2 - 30y + 81 = 0$

$(y-3)(y-27) = 0 \rightarrow y = 3$ or $y = 27 \rightarrow 9^{x-1} = 3 \quad 9^{x-1} = 27$

$x = 3/2$ or $x = 5/2$