

1st Q: 1) $\frac{x}{5} = \frac{y}{7} = \frac{z}{9} = k$ & $2x - y + 3z = 180$ --- (a)

Then $x = 5k$; $y = 7k$ and $z = 9k$ ^{1/2}

Sub values of x, y & k in (a) to get.

$k = 6$ ^{1/4}

Thus, $x + y + z = 5k + 7k + 9k = 126$ ^{1/4} [a] ^{1/4}

2) Let L' be new length of rectangle.
and w' be reduced length of rectangle.

So, $L' = (1 + \frac{20}{100})L$ and $w' = (1 - \frac{20}{100})w$.

$L' = 1.2L$ ^{1/2} $w' = 0.8w$ ^{1/4}

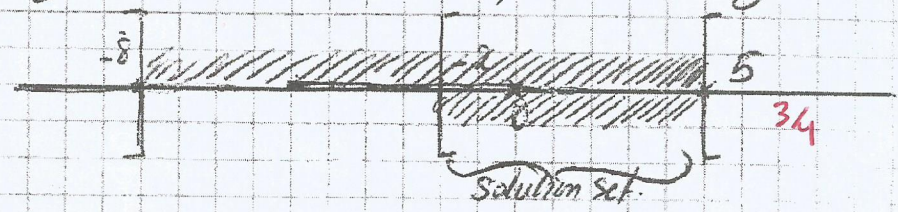
$A' = L'w'$

$A' = (1.2)(0.8)(L)(w)$
 $A' = 0.96A$ ^{1/4}

Hence, ratio of reduction is (0.04) ^{1/4}

Thus, New rectangle is a reduction of old one by 4%. [a] ^{1/4}

3) $\begin{cases} [-2, 5[\\ -8 \leq x < 5 \end{cases}$



x belongs to $[-2, 5[$ since it satisfies both conditions simultaneously ^{1/4} [a]

4) $6 \cos \alpha - 4\sqrt{2} \sin \beta = -1$ --- (1)

$(2 \cos \alpha + \sqrt{2} \sin \beta = +2) \times 4$ --- (2)
add

$14 \cos \alpha = 7$

$\cos \alpha = \frac{1}{2}$

Hence, $\alpha = \cos^{-1}(\frac{1}{2})$
 $\alpha = 60^\circ$ ^{3/4}

Since none of the given choices include $\alpha = 60^\circ$ except "a" ^{1/4}
Thus [a] ^{1/4}