a.

[12, 4, -8]

[12, 0, 6]

[-3, -1, 5]

[10, 2, 5]

A^T =

[12, 12 ,-3 ,10 ]

[4, 0, -1, 2 ]

[-8, 6, 5, 5]

b.

v = [3,-1,4]

vM = [a, b, c]

a= (3 \* -2) + (-1 \* 5) + (4 \* 1)

a = -6 + -5 + 4

a = -7

b = (3\*0) + (-1 \* 7) + (4 \* 4)

b = -7 + 16

b =9

c = (3 \* 3) + (-1 \* -6) + (4 \* 2)

c = 9 + 6 + 8

c = 25

vM = [-7, 9, 25]