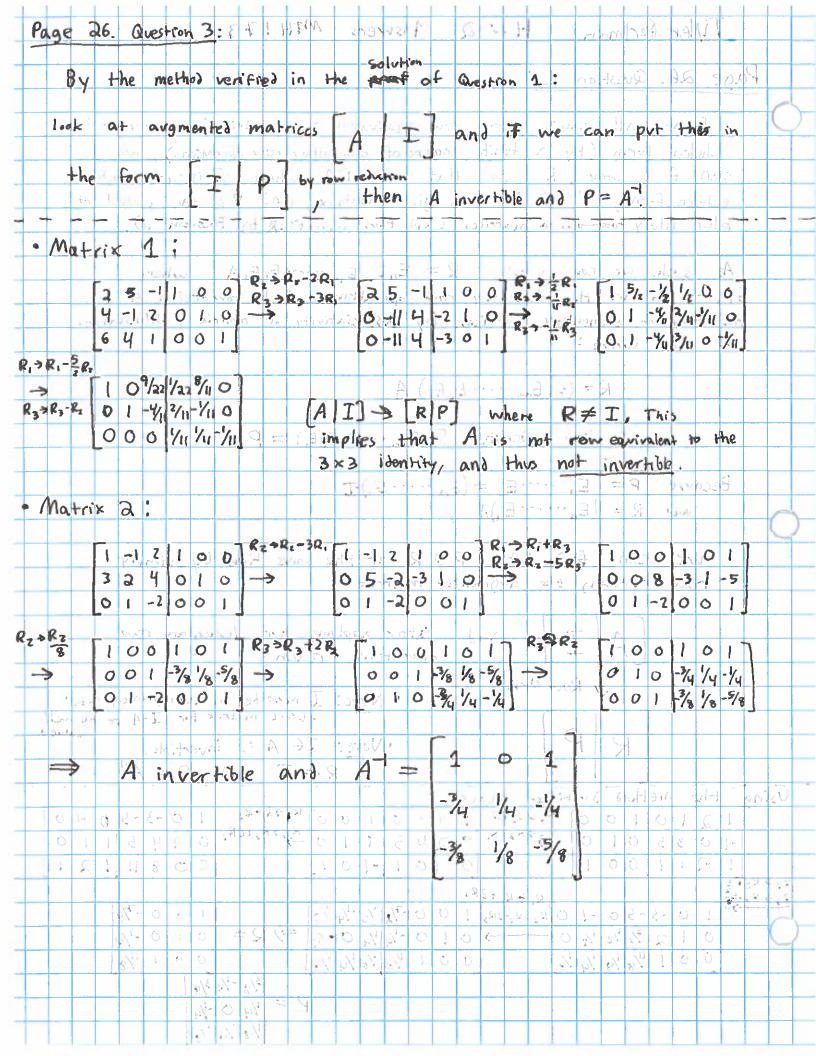
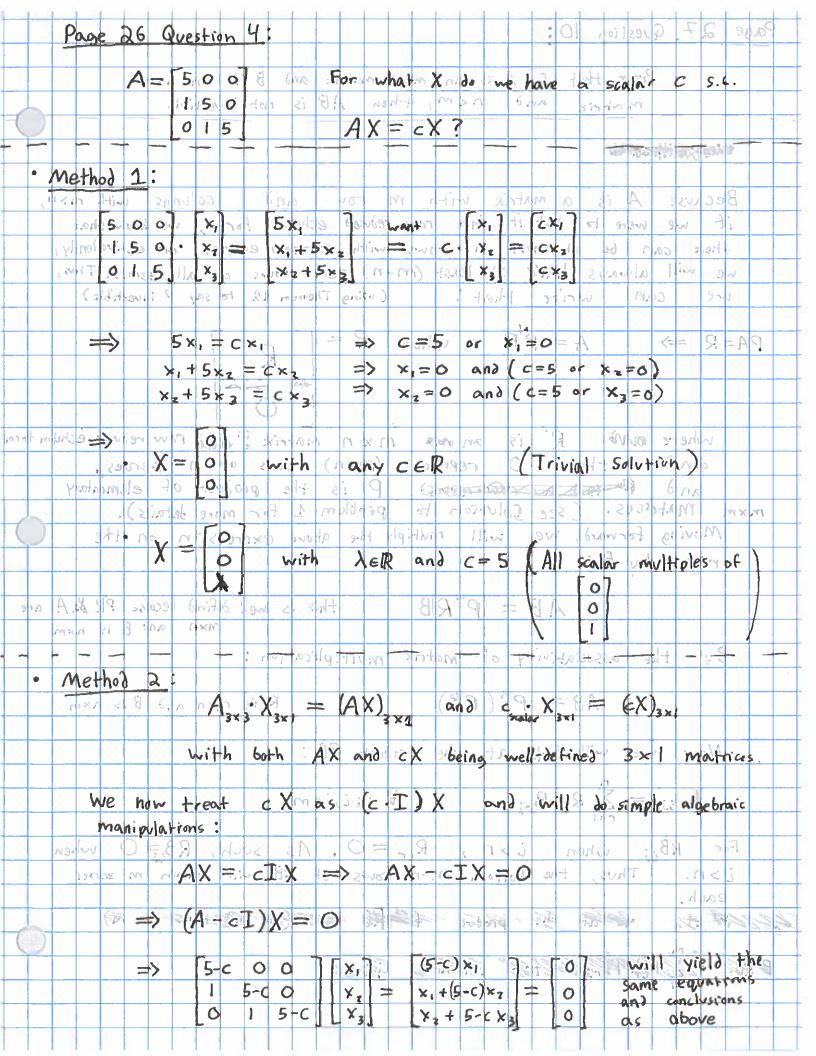
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Page 27 Question 10: Prove that if A is an men matrix and B is an axm and nam, then AB is not invertible matrix When The view of the Because A is a matrix with m rows and n columns with mon if we were to put it into row reduced echelon form, we know that there can be at most in rows with non-zero entries, or equivalently, we will always have at least (m-n) remot tows of all recoess. Thus, we can write that (using Theorem 12 to say Pinvertible) PA=R => A == P'R where R = R where part R is an man mxn matrix in and row reluce echelon form and the O represents (min) rows of no zeroes, and the product of elementary mxm matrices. (see Solution to problem 1 for more details). Moving forward, we will multiply the above expression on the right by B: AB = (P-R)B + this is nell defined because PR & A are men and B is hem By the associativity of matrix multiplication: (X AB = P (RB) (XA) = R (is mix n and B is nxm Now we will look at the product RB: 100 For RBi; when isn, Rin = O. As such, RB = O when isn. Thus, the bottom m-n rows of RB will contain m zeroes each.

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   (c(f+g))(t) = c[f(t)+g(t)] = cf(t)+cg(t)=(cf+cg)(t)
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  Page 34 Question 7
    V= {(*)) 6 (R*1R }-(F=1R - (4)) 12 + (3) 20.
     (x,y) + (x1, y1) = (x+x1,0)
      C(x,y) = (cx,0)
    Field = IR
    V= { (x, y) E IRXIR }
      (x_1, y_1) + (x_2, y_2) = (x_1 + x_2, 0) = (x_2 + x_1) = (x_2, y_2) + (x_1, y_1) \vee
  (x1, 1/1) +((x2, 1/2) +(x3, 1/3)) = (x1, 1/1) + (x2+x3, 0) = (x1+x2+x3, 0)
   ((x, +, )+(x2, Y2))+(x3, Y3) = (x, +x2, 0) + (x3, Y3) = (x, +x2+x3, 0) V
```

