2 Can argument data not her surprising? 3 avoid the norm squared of a vector x welchor work or does it have to be vector a vector? 4 What are the unknown? 5 where will mild scores come out? 5 where will mild scores come out? 6 What are the unknown? 7 If all the measurements are correct, what does load squares give? 8 What does Professor Waler is blue black diagram near? 9 What does Professor Waler is blue black diagram near? 9 Why do we minimize e? 10 Why do we minimize e? 11 white the professor waler of the professor waler to be a well as a sparred to be a vector in the professor waler to be a vector in the professor waler to be the professor waler to be a vector in the professor waler to be the control of the professor waler to be a vector in the professor waler to be the control of the professor waler to be a vector in the professor waler to be a vector in the professor waler to be the control of the professor waler to be a vector in the professor waler to be the control of the professor waler to be a vector in the professor waler to be the control of the professor waler to be the control of the professor waler to be the control of the professor waler to be a vector in the professor waler to be the control of the professor waler to be the contr	#	Question	Answer(s)
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show what must not access come out? why are the quations as 1-fl and the net -1 and there is -1 and the search of -1 and	3		Either will work. the sign difference goes away with the norm
the depends on how we subtract the equations. You can also factor the _2 into (a 1-b1) It dill the measurements are correct, what does least square give? What does Professor Waller's blub-Back diagram man? Why do we equare it? Why do we man the second of the _2 into (a 1-b1) Why do we man the second of the _2 into (a 1-b1) Why do we man the second of the _2 into (a 1-b1) Why do we man the second of the _2 into (a 1-b1) Why do we man the command of the _2 into (a 1-b1) Why do we need a separate variable but has the second of the part of the _2 into (a 1-b1) Why do we need a separate variable but has the second of the part of the _2 into (a 1-b1) Why do we need a separate variable but has the second of the _2 into (a 1-b1) Why do we need a separate variable but has the second of the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable put has the _2 into (a 1-b1) Why do we need a separate variable put has the _2 into (a 1-b1) Why do we need a separate variable put has the _2 into (a 1-b1) Why do we need a separate variable put has the _2 into (a 1-b1) Why do we need a separate variable put has the _2 into (a 1-b1) Why do we need a separate variable but has the _2 into (a 1-b1) Why do we need a separate variable put has the _2 into (a 1-b1) Why do we need a separate variable put has a vector of the end of t	4	What are the unknowns?	The unknowns are the 2 values in the x vector (x1 and x2)
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The substance of the control of the	6		It depends on how we subtract the equations. You can also factor the -2 into (a1-b1).
## What does Pricessor Valler's Subre black diagram mean? ## Why do we square it? ## Why do we square it? ## Why do we minimize e? ## Why do we minimize e? ## Why we have two unknown vector here right. I hat and b hat? ## Why how does b-hat and b create a right triangle sincularity to the arminimize it to make an estimation as good as possible. ## Why how does b-hat and b create a right triangle sincularity the does to be arminimized in the price of the specific price. ## Why how does b-hat and b create a right triangle sincularity the does to be arminimized they are does to be arminimized. ## Why how does b-hat and b create a right triangle sincularity the does to be arminimized. ## Why how does b-hat and b create a right triangle sincularity the does hat any document of the price of the p	7	If all the measuremnets are correct, what does least square give?	two equations linearly dependent, so we need to take care when doing the least squares.
## of the column space is a plane? Why do we minimize e?	8	What does Professor Waller's blue-black diagram mean?	
make our estimation as good as possible. Yes, but we know that A'r, that = b, that, and to a bar? Whydrow does b hat and b create a right friengle shouldn't they be does to parallel if they need to be similar. Why do we need a separate variable b hat? Shouldn't we just use b' hat is the a vector the A markin's by the single shouldn't we just use b' hat is our estimation of the vector in Remarks to be in col(A). The best we can do list if the error (difference is perpendicular to b_nat hat be a vector the A markin's by the single shouldn't we just use b' hat is our estimation of the vector in Remarks to a the a vector when the same and the same	9	why do we square it?	Its generally nicer to work with norm squared, so we don't have ot deal with square roots.
11 we have two unknown vector here right, x hat and b hat? 2	10	Why do we minimize e?	
to parallel if they need to be similar. Why do we need a separate variable b hat? Shouldn't we just use D? Why do we need a separate variable b hat? Shouldn't we just use D? Why do we need a separate variable b hat? Shouldn't we just use D? Why do we need a separate variable b hat? Shouldn't we just use D? Why do we need a separate variable b hat? Shouldn't we just use D? Yes in this example the A matrix has one column, which is the a vector. The a vector is basically given by the problem we want to solve. After we set up the system of equations from our measurels, we will know the a vector. The a vector is basically given by the problem we want to solve. After we set up the system of equations from our measurels, we will know the a vector. This is just part of the example. col(A) is just some general subspace. Whe rout that y is in col(A), so it can be written as some linears, ore well an include those coefficient of t, c2, since we don't know either of them at the beginning. In how can the vector z be perpendicular to multiple vectors if the vectors in the part of the definitions at the beginning of the problem (it was given to us). Why are they(A and b-Ax) perpendicular? Why are they(A and b-Ax) perpendicular? Why are they(A and b-Ax) perpendicular? Why why is that Axhat Why why is that Axhat Why is hat Axhat Why why is that Axhat The identity matrix A T, the transpose, is not guaranteed to be the inverse of A. In general, it is not. Conceptually, we start with A and b. what he error vector. We want the head reprediction will could be a spendicular to col(A). The original was a best estimate. Sometimes we want to check our estimation of the vector brown shat, which is our estimation of the vector brown shat, which is our estimation of the vector brown shat, which is our estimation of the vector brown shat, which is our estimation of the vector brown shat, which is our estimation of the vector brown shat, which is our estimation of the vector brown shat, which is our estimation of the	11	we have two unknown vector here right, x hat and b hat?	
13 Why do we need a separate variable b hat? Shouldn't we just use b? 14 Is the a vector the Amatrix? 15 How do we know what's the a vector? 16 How can we know that the column space is a plane? 16 How can we know that the column space is a plane? 17 Where did the Cs come from? Why is it claft + c2a2 + and not just safe the column space is a plane? 18 Why end the Cs come from? Why is it claft + c2a2 + and not just safe the column space is a plane? 19 Why can't we use Gaussian Elimination to solve for x_haif if we have have a last on top which are sent in solve for x_haif if we have how can the vector z be prependicular to milliple vectors if the vectors per plane in the column space is a plane? 20 Is should the x in Ax have a had no top in this case no. We're using the vector is a plane can be either parallel or not. 21 Is should the x in Ax have a had no top in this case no. We're using the vector is a plane can be either parallel or not. 22 Is why are they/A and b-Ax) perpendicular? 23 Why are they/A and b-Ax) perpendicular? 24 Why are they/A and b-Ax) perpendicular? 25 Why is blat Axhat Safe in this case no. We're using the where the reverved to perpendicular to a plane is perpendicular to more of the critical parallel or not. 26 Why is blat Axhat Safe in this case in the column of Axia and the xia had be alther parallel or not. 26 Why is blat Axhat Safe in this case in the column of Axia and the xia had be alther parallel or not. 27 Why is blat Axhat Safe in this case in the column of Axia and the xia had be alther parallel or not. 28 Why is not. A if the identity matrix Axia and the column of Axia and the xia had be alther parallel or not. 29 How many dimensions will we me asked to solve on the exam though the columns of Axia and the parallel or not. 29 How many dimensions will we me asked to solve on the exam though the columns of Axia are linearly dependent? 30 Why is a had a special parallel or not. 31 how did you get the b hat equation on the left side? 32 Why is a had a special parallel or the	12		
How do we know what's the a vector? 16 How can we know that the column space is a plane? Where did the Cs come from? Why is it cla1 + c2s2 + and not just a fixed the column space is a plane? Where did the Cs come from? Why is it cla1 + c2s2 + and not just a fixed the column space is a plane? Where did the Cs come from? Why is it cla1 + c2s2 + and not just a fixed the column space is a plane? Where did the Cs come from? Why is it cla1 + c2s2 + and not just a fixed the column space is a plane? Who was the vector with the inner product of 12 and the a is equal to 0 Why can't we use Gaussian Elimination to solve for x_hat if we have b_hat? Now can the vector z be perpendicular to multiple vectors if the vectors arent parallel bow can the vector z be perpendicular to multiple vectors if the vectors arent parallel bow can the vector z be perpendicular to multiple vectors if the vectors arent parallel why are they(A and b-Ax) perpendicular? Why is bhat Axhat Why is bhat Axhat Why is bhat Axhat Why is bhat Axhat A_T, the transpose is not guarantion of the vector x. A_T, the transpose is not guarantion of the vector x. Why why we start with A and b, which are like the masks and measurements from imaging. We want to find and b, hat that gives us a best estimated to the five tevetor x. Will we be given a problem where we need to solve for the x vector even though the columns of A are linearly dependent? Why was supposed to be a vector? what does x being a scalar tell us? If we use Gaussian Elimination first on a system then use the least square algorithm, will that change the result? Why while we give the mask of the macroscope and the column space of though the columns of A are linearly dependent? We won't make the manifection in the plane the column space of the vector while ye was a classing the result? Why was Gaussian El	13	Why do we need a separate variable b hat? Shouldn't we just use b?	
15 How do we know what's the a vector? 16 How can we know that the column space is a plane? Where did the Cs come from? Why is it claft + c2a2+ and not just at 1+22+? Where did the Cs come from? Why is it claft + c2a2+ and not just at 1+22+? Why set his mere product of z and the a's equal to 0 Why can't we use Gaussian Elimination to solve for x, hat if we have 0, hat? In why is the inner product of z and the a's equal to 0 Why can't we use Gaussian Elimination to solve for x, hat if we have 0, hat? In which we have a hat on top 1 in his case no. Were using the beginning. In which we have a hat on top 1 in his case no. Were using the identity Ax = b + c> = Ax - b DAX = e, the error vector. We should he x in Ax have a hat on top 2 in his case no. Were using the identity Ax = b + c> = Ax - b DAX = e, the error vector. We not estimation of the vector x or years of the effort of the west of the event of the nath, which is our of the effort of the math the beginning. Why are they/A and b-Ax) perpendicular? Why are they/A and b-Ax) perpendicular? Why isn't A.T. The identity matrix A.T. the transpose, is no que estimated to be the west or forth and the vector x or the vector x hat, so we want to minimize the norm of the error vector. What had and b. which are like the masks and measurements from impaing. We want to find x, hat and b. hat that quise us a best estimate. It was part of the edefinitions at the beginning of the profiled in (to any vectors in that plane). A.T. the transpose, is no que estimated to be the inverse of A. In general, it is not. Conceptually, we start with A and b. which are like the masks and measurements from impaining. We want to find x, hat and b. hat that quise us a best estimate. Sometimes we want to check our estimation error, i.e. the difference between b and bhat who will we be given a problem where we need to solve for the x vector even the way and the vector. The touck of the profile of the vector of the profile of the vector of the profile of the vector o	14	Is the a vector the A matrix?	Yes in this example the A matrix only has one column, which is the a vector.
Where did the Cs come from? Why is it ctal + c2a2 + and not just al +a2+? Where did the Cs come from? Why is it ctal + c2a2 + and not just al +a2+? Why is the inner product of z and the a's equal to 0 Why can't we use Gaussian Elimination to solve for x_nat if we have b_hat? Why can't we use Gaussian Elimination to solve for x_nat if we have b_hat? Now can the vector z be perpendicular to multiple vectors if the vectors aren't parallel or not. In >3 dimensional space it's possible. A vector perpendicular to a plane is perpendicular to any vectors in that plane. Vectors in a plane can be either parallel or not. In >3 dimensional space it's possible. A vector perpendicular to a plane is perpendicular to any vectors in that plane. Vectors in a plane can be either parallel or not. In >3 dimensional space it's possible. A vector perpendicular to a plane is perpendicular to a plane is perpendicular to any vectors in that plane. Vectors in a plane can be either parallel or not. In >3 dimensional space it's possible. A vector perpendicular to a plane is perpendicular to any vectors in that plane. Vectors in a plane can be either parallel or not. In >3 dimensional space it's possible. A vector perpendicular to a plane is perpendicular to any vectors in that plane. Vectors in a plane can be either parallel or not. In this case no. Were using the identity Az = b + o = EAx - b. D-Ax = e, the error vector. Yet on the vector is perpendicular to col(A). D-Ax = e, the error vector. That occurs when the error vector is perpendicular to col(A). Why is bhat Axhat A why will we started by getting b hat it thought we started by getting b hat why will we started by getting b hat thought we started by getting b hat why will we nead to find b, hat are invertible? Who will we be given a problem where we need to solve for the x vector even though the columns of A are linearly dependent? When will we be given a problem where we need to solve for the xector. In this case not be a will be given a problem where	15	How do we know what's the a vector?	
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how can the vector z be perpendicular to multiple vectors if the vectors arent parallel how can the vector z be perpendicular to multiple vectors if the vectors arent parallel to any vectors in that plane. Vectors in a plane can be either parallel or not. 11	18	why is the inner product of z and the a's equal to 0	That was part of the definitions at the beginning of the problem (it was given to us).
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22 isnt it x hat???? 23 Why are they(A and b-Ax) perpendicular? 24 Why is bhat Axhat 25 Why jan't A_T'A the identity matrix 26 it hought we started by getting b hat 27 why would we need to find b_hat 28 will we be given a problem where we need to solve for the x vector even thought the columns of A are linderly dependent? 29 How many dimensions will we measked to solve on the exam 29 It hought x was supposed to be a vector? what does x being a scalar tell us? 29 If we use Gaussian Elimination first on a system then use the least squares give us the same solution as the world was when we have an exact solution. So when an exact solution what is why we should always do least squares? 30 When will we get our mildtern 2 grades? 31 Above did you get the bhat equation on the left side? 32 When will we get our mildtern 2 grades? 33 Above always multiply matrices from right to left? 34 When will we get our mildtern 2 grades? 35 What happens if col of A are Lin dependent? 36 Why is n't x hat was exactly a, like the projection of b onto a was a, l. e alpha = 1 37 What would it mean if b_hat was exactly a, like the projection of b onto a was a, l. e alpha = 1 36 Kinda random, but how are on the left side? 37 What would it mean if b_hat was exactly a, like the projection of b onto a was a, l. e alpha = 1 38 What nappens if col of A are Lin dependent? 39 What may be down or	20		
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25 Why is bhat Axhat 26 Why isn't A_T'A the identity matrix 27 Conceptually, we start with A and b_which are like the masks and measurements from imaging. We want to find x_hat and b_hat that gives us a best estimate. 27 why would we need to find b_hat 28 Will we be given a problem where we need to solve for the x vector even though the columns of A are linearly dependent? 29 How many dimensions will we measked to solve on the exam 1 I thought x was supposed to be a vector? what does x being a scalar tell us? 30 If we use Gaussian Elimination first on a system then use the least square algorithm, will that change the result? 31 A why will we ge dour midterm 2 grades? 32 When will we get our midterm 2 grades? 33 do we always multiply matrices from right to left? 34 When will we get our midterm 2 grades? 35 Why is A not invertible? 36 Why is A not invertible? 37 If there is no noise will leadt square give us the same solution as GE and that is why we should always do least square? 38 What happens if col of A are Lin dependent? 40 What would it mean if b_hat was exactly a, like the projection of b onto a was a, i.e alpha = 1 Kinda random, but how are orbital trajectories of planets determined 40 Kinda random, but how are orbital trajectories of planets determined 40 Kinda random, but how are orbital trajectories of planets determined	23	Why are they(A and b-Ax) perpendicular?	norm of the error vector. That occurs when the error vector is perpendicular to col(A)
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