

## Normalization example

The email depicted in Figure 2 arrived into the inbox of the email address jblogs@school.ie.

Dear Joe Bloggs,

Thank you for your purchase from Book Haven Bookshops ([www.bookhaven.ie](http://www.bookhaven.ie)).

Your Authorisation number for this purchase is: 012345. Your Order Number is 54321

DELIVERY INFORMATION: 10 the road, the district, Dublin, IRELAND

### BASKET INFORMATION

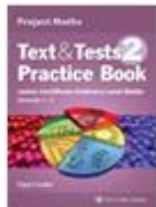
TITLE: Planete Ados JC  
AUTHOR: DOYLE, MARY  
BARCODE: 9781847412386  
COVER: Yes  
BAY NUMBER: DOYLE MARY  
LYNCH BERNARD  
1 x €31.00



TITLE: iChallenge  
AUTHOR: COTTER,  
MCDERMOTT, MEADE/ Edco  
BARCODE: 9781845365585  
COVER: Yes  
BAY NUMBER: COTTER  
1 x €27.70



TITLE: Text and Tests 2 Practice Book Strands  
1-5  
JC OL  
AUTHOR: COOKE PAUL/  
Celtic Press  
BARCODE: 9781907705243  
BAY NUMBER: COOKE PAUL  
1 x €6.90



TITLE: Viel Spass 2!  
AUTHOR: O'ROURKE, NIAMH  
BARCODE: 9780714416977  
COVER: Yes  
BAY NUMBER: O'ROURKE  
1 x €34.75



TITLE: Text And Tests 2  
Project Maths 2014 HL  
Strands 1 To 5  
AUTHOR: MORISS, COOKE,  
BEHAN  
BARCODE: 9781907705212  
COVER: Yes  
BAY NUMBER: MORISS  
1 x €19.65



**Nett: €120.00 Postage: €6.50 Total Value: €126.50**

Figure 1 Joe's email

For the purposes of normalization you may assume that an email address is associated with a single customer name, but the delivery address may change from order to order. The bay number indicates the bay where the book is located in the store's stock room. All copies of a single book are located in the same bay. In the context of this system, books are uniquely identified by the barcode. As you can see, Joe has chosen to get three of his books covered (no charge). The image is also unique to the book.

2. (a) Represent the data in unnormalized form. (5 marks)
- (b) Using the form(s) resulting from 2(a), derive first normal form (5 marks)
- (c) Using the form(s) resulting from 2(b), derive second normal form (5 marks)
- (d) Using the form(s) resulting from 2(c), derive third normal form (5 marks)
- (e) Using the forms resulting from 2(d) depict the forms as an ERD. (10 marks)