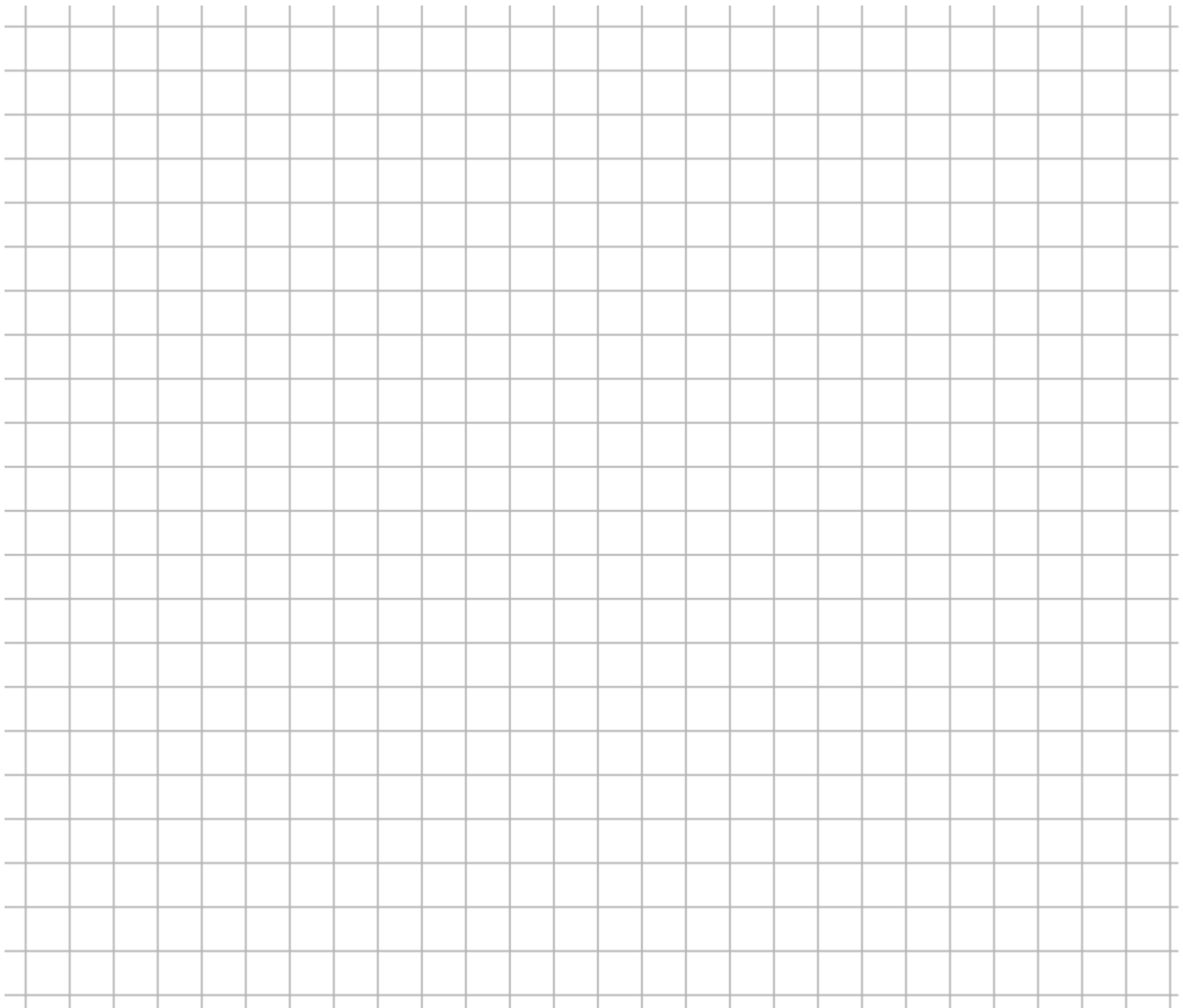# Trial Linear Algebra #3

D'wayne is having a party and wants to buy lots of pizzas.
- Pizza4U charge $8 a pizza.
- Randy's Pizzas charge $20 for the first two, then $6 for each one after that.
- Alberto's charge $7.50 a pizza, but have a delivery fee of $10 as well.

a) How much does it cost to buy 10 pizzas from the different options?

b) Write algebraic formulas for how much they charge. (NB: the one for Randy's is quite hard!)

c) Graph the situation.

d) How many pizzas does D'wayne have to buy before he is better off buying from Randy's Pizzas?

e) If he wants to keep his $10 delivery fee, how much should Alberto charge so that he is cheapest for any order of 4 or more?

Answers: Trial Linear Algebra #3

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- Pizza4U charge $8 a pizza.
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a) How much does it cost to buy 10 pizzas from the different options?
Pizza4U : C = 8 × 10 = $80
Randy: C = 20 + 6 × 8 = $68
Alberto: C = 10 + 7.5 × 10 = $85

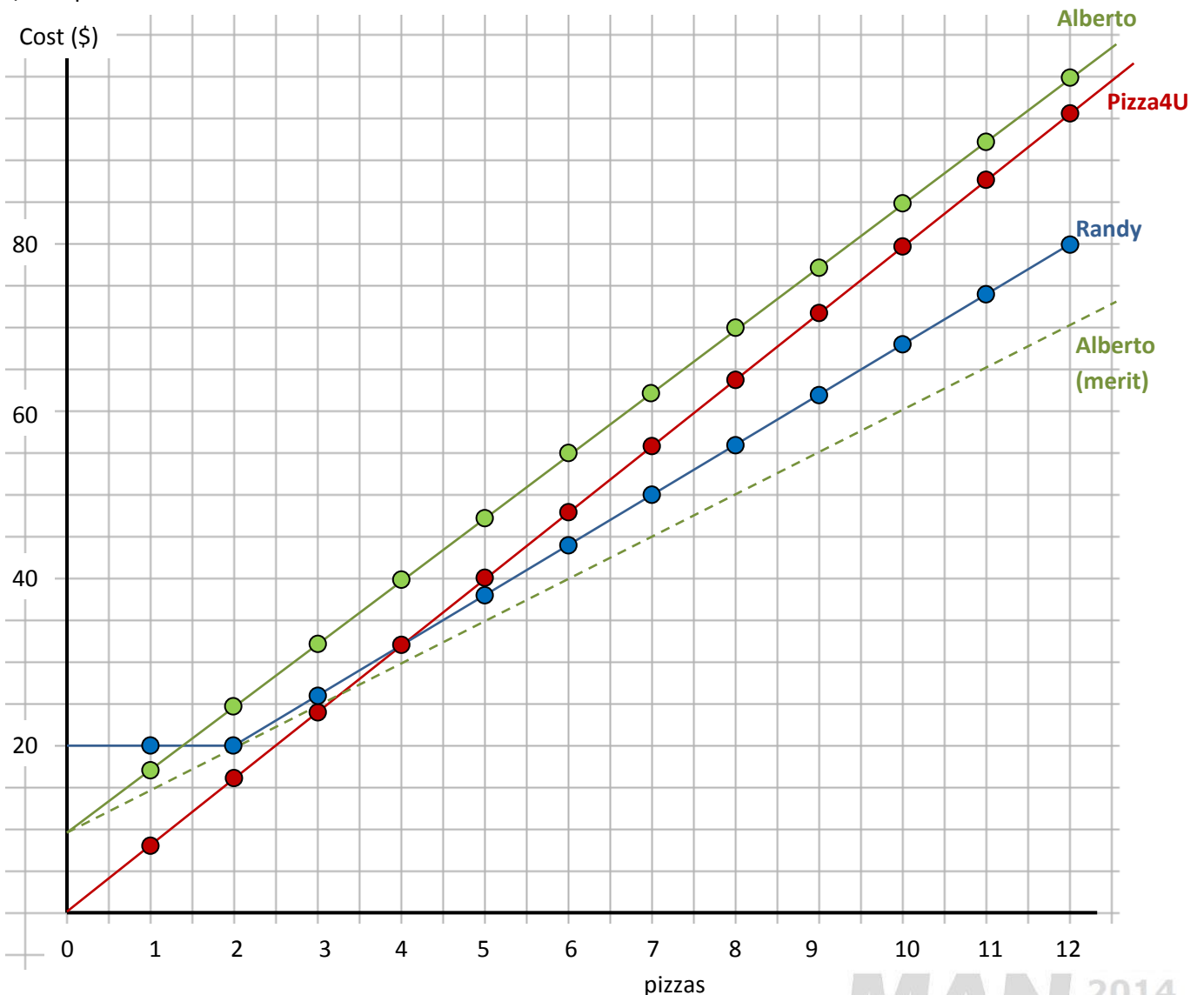b) Write algebraic formulas for how much they charge.
Pizza4U : C = 8 p
Randy: C = 6 (p − 2) + 20 for p ≥ 2, and
           C = 20 if p = 1   **(note: this one is Merit+ level)**
Alberto: C = 7.5 p + 10
Where C is the cost, in dollars, and p is the number of pizzas bought.

c) Graph the situation.

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d) How many pizzas does Dwayne have to buy before he is better off buying from Randy's Pizzas?

From the graph it can be seen that at 4 pizzas they cost the same amount, so he is better off buying from Randy when buying five or more.

or

Solving formally, for Merit+:

Pizza4U Cost = Randy Cost

8 p = 20 + 6 (p − 2)

8 p = 20 + 6 p − 12

2 p = 8

p = 4

Any order greater than 4 is better from Randy.

e) If he wants to keep his $10 delivery fee, how much should Alberto charge so that he is cheapest for any order of 4 or more?

From the graph it can be seen that at 4 pizzas he needs to charge $30 or so. That means a cost of $5 a pizza would do it.

or

Solving formally, for Merit+:

Alberto < Pizza4U

10 + x p < 8 p

10 + x × 4 < 8 × 4

10 + 4 x < 32

4 x < 22

x < 5.5

Alberto needs to charge less than $5.50 a pizza.

$5.40 would make the most money and still be cheapest for 4 or more.