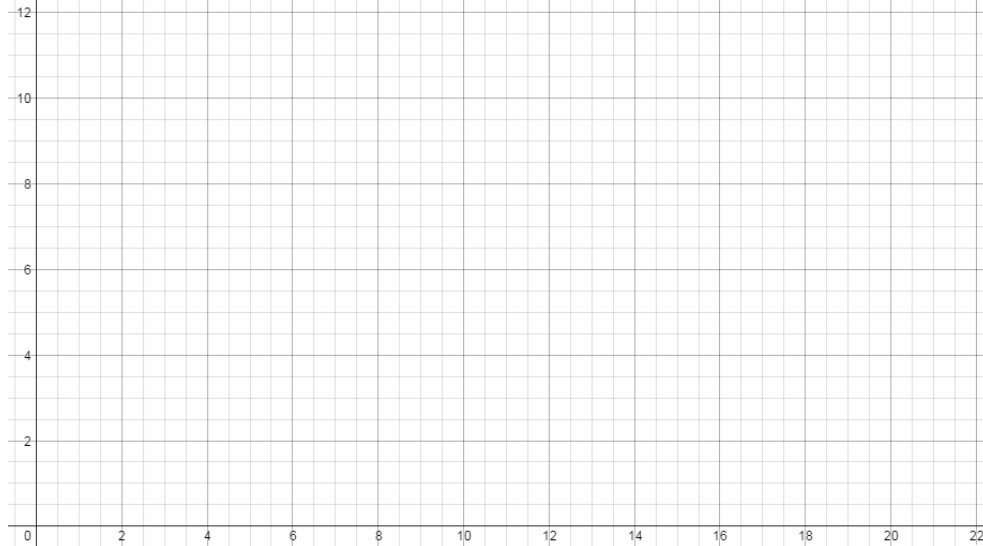


Linear Programming (2) Using the Objective Line Test. – www.m4ths.com

(1) LaShondra is selling 2 different types of poster (poster #1 and poster #2) at a school fete. She can make £4 profit on every poster #1 she sells and £3 profit on every poster #2 she sells. LaShondra has a budget of £40 to buy the posters she is going to sell. One poster #1 will cost her £2 and one poster #2 will cost her £4 at the wholesaler. The wholesaler only has 9 of poster #2 in stock. For every poster #2 she sells she can sell no more than 2 of poster #1. Let x be the number of poster #1 and y be the number of poster #2.

- Write down the objective functions.
- Write down the constraints, simplifying each.
- Graph the situation below and label the feasible region R.
- Draw an objective line on the graph.
- Use the objective line test to **find the maximum profit** LaShondra will make.



(2) Trevor is hiring out two types of bicycle. One is a single bicycle (seats 1 person) and the other is a tandem (seats 2 people).

Trevor has agreed to cater for a group of tourists and signed a contract stating that at least 30 people will have transport to see the sights of Wisbech.

Trevor wishes to minimise the cost of the contract. He buys each bike for £40 and each tandem for £50 is a sale from the bike shop. The shop only holds 16 bicycles and can source an unlimited number of tandems.

Let x be the number of single bicycles and y be the number of tandems.

- Write down the objective function.
- Explain what the inequality $3x \geq 2y$ in the context of the question.
- Write down the other constraints.
- Graph the situation below and label the feasible region R.
- Draw an objective line on the graph.
- Use the objective line test to find the minimum cost Trevor **will have to pay** to satisfy the contract.

