

Student Name:

							Total
Criteria 1	0	8	16	24	32	40	
Criteria 2	0	8	16	24	32	40	
Criteria 3 & 4	0	4	8	12	16	20	

Mathematics Secondary 5 CST
Situational Problem – Bicycle Business

Wheel Dealer produces mountain bikes and road bikes. For now, due to a shortage of employees, the company can manufacture no more than 80 bikes per week. Their main customer is the retail outlet *Trekkers*. *Wheel Dealer* has promised to ship them at least 45 mountain bikes and more than 10 road bikes per week. Consumer demand has shown that they need no fewer than 3 times as many mountain bikes as road bikes.

Each mountain bike costs *Wheel Dealer* \$145 to make; each road bike costs them \$105 to produce.

In a recent development, *Wheel Dealer* has been asked to supply bikes to one of *Trekkers* competitors, *CyclePath*. *CyclePath* needs a guarantee that the manufacturer can deliver up to 100 bikes. All the other constraints will still apply. That is, *CyclePath* will want the same mix of mountain and road bikes, and consumer demand will still require no fewer than 3 times as many mountain bikes as road bikes.

As a result of this development, *Wheel Dealer* would need to hire a student to work part-time assembling bikes. The company could then increase their output to a maximum of 100 bikes per week. If they take on the student, their costs will rise to \$160 per mountain bike and \$110 per road bike. This will cover the additional salary and benefits to the student employee.

Trekkers and *CyclePath* each insist that the manufacturer give them exclusive rights to their bikes. *Wheel Dealer* must decide which retailer to sell their bikes to.

What they charge *Trekkers*

Wheel Dealer charges them \$320 for a mountain bike and \$355 for a road bike.

What they would charge *CyclePath*

Wheel Dealer would charge them \$400 for a mountain bike and \$300 for a road bike.

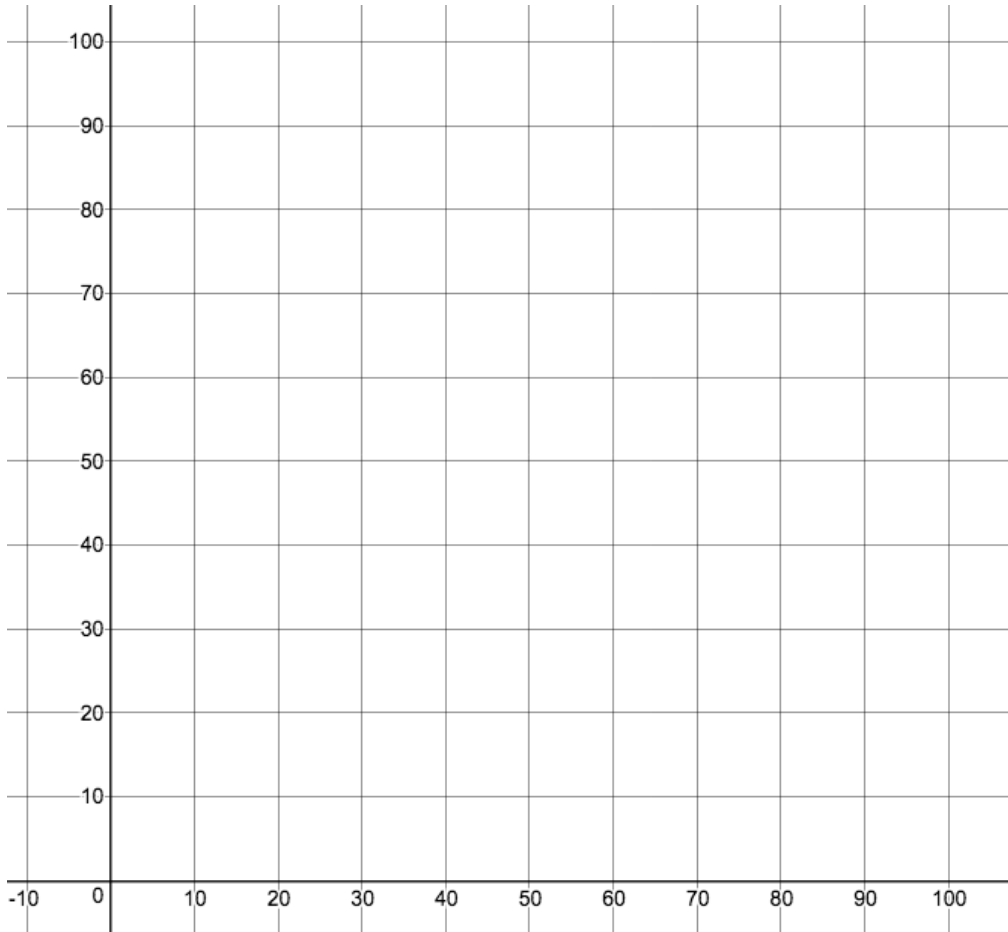
What should the company do to maximize their profits?

- Should they stay with their present customer, *Trekkers*, or should they sell their bikes exclusively to *CyclePath*?
- What mix of road and mountain bikes would give them the maximum profit?
- What would that profit be?

Your answer must be supported with a graphical representation of the situation on the Cartesian plane provided. Please use a ruler to draw your lines! Your work must be organized and complete.



Your solution:



Your solution:

Your solution:

Your solution:
