Island Wheels Ltd is a small manufacturing company that specialises in producing bicycles. These bicycles are mostly hand-made; however, the manufacture of some part required the use of machinery. Because of the quality of the bicycles produced, they normally sell for a premium. The bicycles produced are in three ranges: Road, Trek and BMX. Though not in the same league as the major bicycle producers, Island Wheels have been able to attract a large number of enthusiasts who wanted a quality, hand-made bicycle that does not carry a “brand” name.

You have recently been hired by Island Wheels as a graduate accountant. From your interview, you have been able to ascertain that at present, Island Wheels did not have an accountant and that majority of the accounting tasks had been performed by a part-time accountant, who was now retired.

On your first day at work, you were shown around the whole premises. The company had its offices and manufacturing facility under the same roof. There were 20 bicycle engineers, who were responsible for producing the bicycles by hand; five machine-operators who were responsible for producing the specialised parts; four production supervisors, a purchasing manager, a clerk, two sales persons, a sales manager, Audrey Peters (personal secretary of the owner of Island Wheels, who showed you around the place) and the owner, John Cruise.

After the tour of the premises, you were brought to John’s office where he showed you some documents (See Appendix A). “Our previous accountant was working on some prediction model. I am not sure what it means but he said it would allow us to predict our overhead costs. He left before he could complete this. Take these with you and give me a report on what it means. He mentioned something about cost formulas but I can’t make head or tail of what it means,” John said to you.

“I gather that it has something to do with our expansion plans. But first, get me the correct cost formula or whatever, as there are two graphs there as you can see and I can’t work out which is the right one to use. My understanding is that he used data from the last two years to derive these graphs. There are a lot of numbers there but how do I know what is what? I need that prediction model to see what our overheads would be if we are to ramp up production. Can you get these done by next Monday? That should give you plenty of time, seeing you have the weekend as well,” said John. Wanting to impress on your first day, you said ok and proceed to evaluate the documents in your office. As you sat down, the phone rang. It was John, “Oh, I forgot to ask you, could you make a prediction for me with your cost formula what our

overhead costs would be if we were to increase our labour hours to 8,500? Alternatively, what if we increased our machine time to 2,300 hours? I would like to know whether it is viable for us to do so."

"And another thing," John said before he hung up. "Could you please head down to the floor and see Mark and Patrick? I think they need to discuss with you some issues regarding the costs of our bicycles."

As you put down the phone, you recall that Mark and Patrick were two of the supervisors on the production floor. "What could they possibly want from you?" you think to yourself as you head down there.

You see Mark and Patrick as you approach the production floor. "Hi there," said Mark. "We need your help to work out something. For the life of us, we cannot seem to understand why the cost records show the bicycles costing so much. Our previous accountant said that our costs were increasing drastically but we don't understand why. Can you look into this and tell us why it is costing us so much?"

"John will need it in the report you are preparing for him as well. We need to discuss this at our next meeting," said Patrick. "Damien (the sales manager) will not be happy with these increasing costs because he will have to increase his prices again."

As you started to walk away, Patrick called after you. "Oh, and could you prepare something on the new-fangled costing method everyone and his dog seemed to be talking about? You know, that ABCD-something or other? You might like to tell us what it's about and whether that would help us reduce our costs. John would like to know that, I am sure!"

"Activity-based costing. ABC." You think to yourself as you proceeded to analyse the information.

In order to fully understand the cost of the bicycles, you gathered some more information and worked out the following:

a) The intended sales numbers for the next month were: Road, 1500 units; Trek, 1000 units and BMX, 500 units.

b) The costs of direct materials were $160 per kilograms and the wage rate for the bicycle engineers were $80 per hour.

c) In the past, overhead had been applied on the basis of labour hours for the labour related overheads and on the basis of machine hours for the machine related overheads. The estimated total costs of labour related overhead is $37,000 and machine related overhead is $43,000 for the next month. This method of overhead allocation is expected to continue.

d) The requirements for each of the bicycles follow:

| | **Road** | **Trek** | **BMX** |
|---|---|---|---|
| **Direct Materials (grams)** | 750 | 1400 | 850 |
| **Direct Labour (hours)** | 2.5 | 3 | 1.5 |
| **Machine Time (hours)** | 1 | 0.5 | 0.25 |

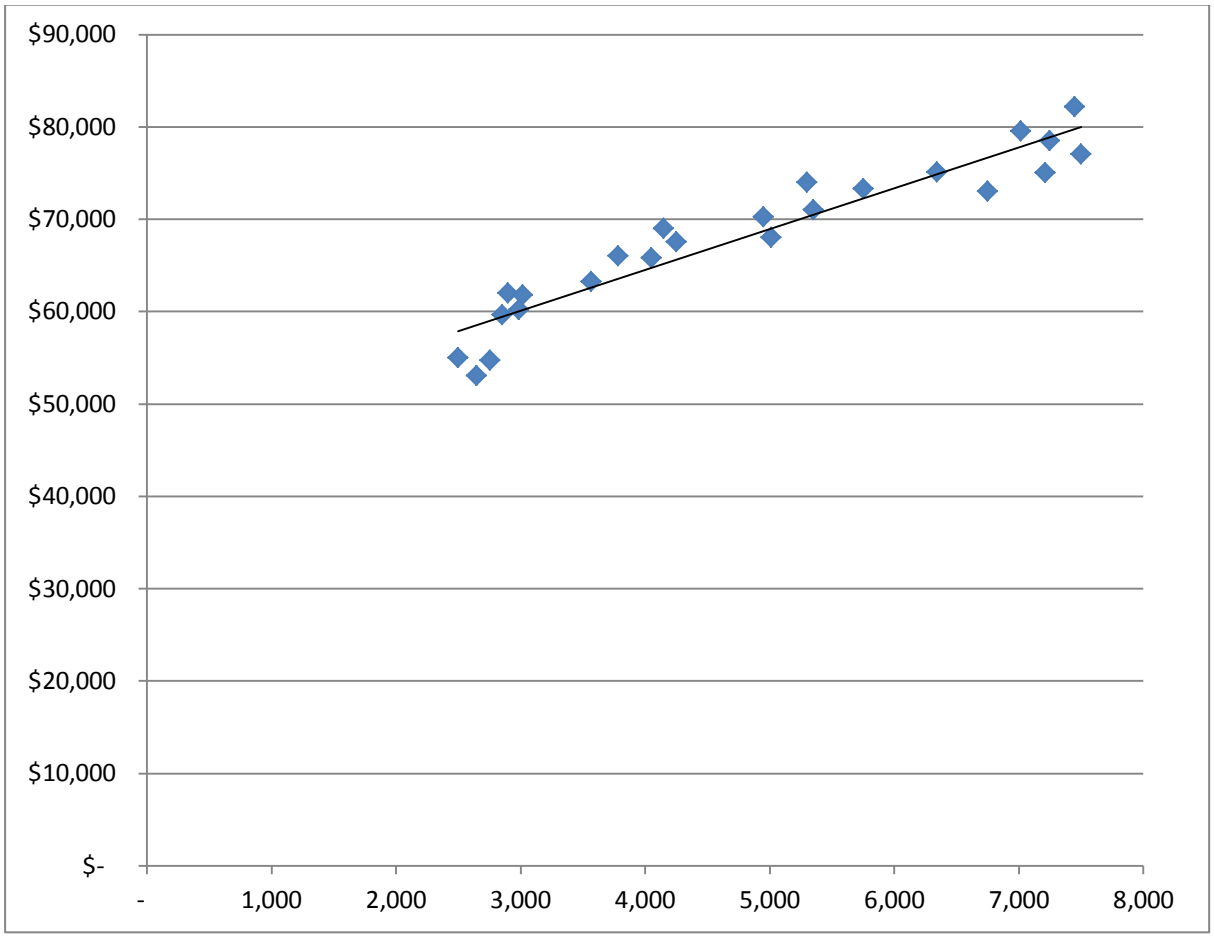
**REQUIRED:**

Prepare a report (no more than 10-pages) for John Cruise that addresses the following:

1) The purpose of a cost formula and the components of the cost formula;
2) Determine the cost formula from the information provided by John Cruise and evaluate the cost formulas;
3) Determine the costs as requested by Jon Cruise and explain whether the prediction is valid;
4) Calculate the product cost of the Road, Trek and BMX bicycles;
5) Explain the concept of ABC, including its benefits and limitations; and,
6) Evaluate whether ABC should be introduced in Island Wheels Ltd.

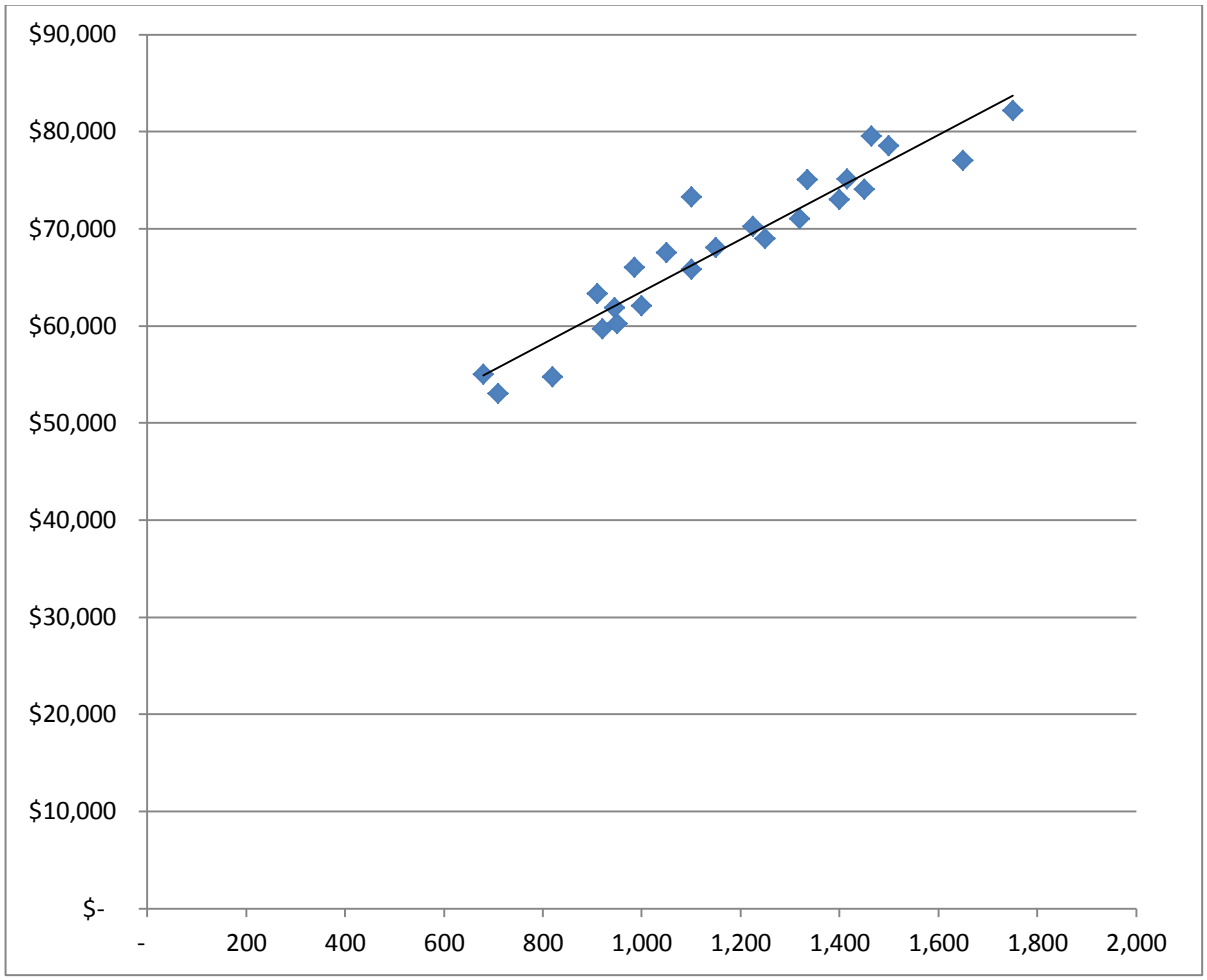
## Appendix A

| | Labour Hours | Machine Hours | Overhead Costs |
|---|---|---|---|
| January | 2,500 | 680 | $ 55,000 |
| February | 2,755 | 820 | $ 54,700 |
| March | 2,985 | 950 | $ 60,200 |
| April | 4,250 | 1,050 | $ 67,500 |
| May | 4,050 | 1,100 | $ 65,800 |
| June | 5,350 | 1,320 | $ 71,000 |
| July | 5,300 | 1,450 | $ 74,000 |
| August | 7,500 | 1,650 | $ 77,000 |
| September | 7,250 | 1,500 | $ 78,500 |
| October | 5,010 | 1,150 | $ 68,000 |
| November | 2,900 | 1,000 | $ 62,000 |
| December | 6,750 | 1,400 | $ 73,000 |
| January | 2,645 | 710 | $ 53,000 |
| February | 3,015 | 945 | $ 61,800 |
| March | 2,850 | 920 | $ 59,650 |
| April | 3,785 | 985 | $ 66,000 |
| May | 4,150 | 1,250 | $ 68,950 |
| June | 4,950 | 1,225 | $ 70,200 |
| July | 5,750 | 1,100 | $ 73,250 |
| August | 7,450 | 1,750 | $ 82,150 |
| September | 7,015 | 1,465 | $ 79,525 |
| October | 6,345 | 1,415 | $ 75,050 |
| November | 3,565 | 910 | $ 63,250 |
| December | 7,210 | 1,335 | $ 75,000 |




SUMMARY OUTPUT FOR LABOUR

| *Regression Statistics* | |
|---|---|
| Intercept | 46862.89075 |
| X Coefficient | 4.420494425 |
| R Square | 0.89947162 |
| Standard Error | 2647.20104 |
| Observations | 24 |




SUMMARY OUTPUT FOR MACHINE

| *Regression Statistics* | |
|---|---|
| Intercept | 36557.37257 |
| X Coefficient | 26.96396219 |
| R Square | 0.902783345 |
| Standard Error | 2603.232264 |
| Observations | 24 |