**Task ➀: The Landscaping Problem**

Malvern C.I. plans to do some landscaping around the school. They have two estimates:

**Landscape Effects:** $240 for a full landscape plan, plus $30 per hour to do the work

**Green Lawn:** $60 per hour to do the work with a free full landscape plan.

1. Complete the table of values for each company.

|  |
| --- |
| **Green Lawn** |
| Time | Cost ($) |
| 0 |  |
| 2 |  |
| 4 |  |
| 6 |  |
| 8 |  |
| 10 |  |
| 12 |  |
| 14 |  |
| 16 |  |

|  |
| --- |
| **Landscape Effects** |
| Time | Cost ($) |
| 0 |  |
| 2 |  |
| 4 |  |
| 6 |  |
| 8 |  |
| 10 |  |
| 12 |  |
| 14 |  |
| 16 |  |



1. Display this data on the grid. Label carefully and use a different colour for each company.
2. At what point on the graph is the cost the same for both companies? (Indicate the time and the cost)
3. Create equations for each scenario described above?
4. Using your answer from question (C), show algebraically both companies will charge the same for the same amount of time.
5. If the job took 6 hours, which company would you choose? Explain your answer.
6. If the job took 12 hours, which company would you choose? Explain.
7. Which company charges the best rates? Under what circumstances is one company better than the other? Complete each of the following sentences.

 I would choose Landscape Effects if… I would choose Green Lawn if …

**What is the POI, for the system shown above?**

**Important Definitions**



* A system of equations is created when multiple equations are graphed together on the same grid.
* The point of intersection, POI, of the lines shown is also called the “solution” of the system.

**Let’s think about the following:**

Can a system of 2 equations ever have two solutions? Explain:

* If, however, the two lines are parallel to one another, how many solutions, or points will the lines have in common? Explain:
* Also, if there are two lines in a system of equations that happen to be right on top of one another, then how many points will the lines have in common?

**Let’s Practice ➁** Solve the linear system graphically.

|  |  |
| --- | --- |
| $$y=\frac{x}{2}-3$$$$ y=-2$$**POI:** |  |

|  |  |
| --- | --- |
| $$3x-2y+4=0$$$$ y=\frac{3x}{2}-2$$ **POI:** |  |
| $y=\frac{1}{3}x-3$$$-6x+2y-10=0$$**POI:** |  |

1. Verify the POI in question ➁ c) is correct using a LS/RS check format.

 **Learning Goals:**

**🞏 I can find the point of intersection by graphing a system of equations.**

**🞏 I understand what is meant by the “the solution” to a linear system.**

**🞏 I can use a LS/RS check format to determine if my solution satisfies the system.**

**Task** ➂ **Telus vs. Koodo**

Serge is choosing a cellphone plan and wants the lowest cost.

 Telus charges $12 per month plus $0.05 per minute for cellphone service.

 Koodo charges $28 per month for unlimited minutes.

Determine under which conditions Serge should choose Telus and under which conditions Serge should choose Koodo. **Justify** your answer.





**Task ➃ The Baby Sitters Club**

Phylida and Tori are comparing their weekly earnings from babysitting.

The following graph shows their relations between time and cost.

1. Phylida says, “If we both work less than 5 hours or more than 15 hours, I earn more than you”. Label each line with the correct girl’s name.
2. Describe what the graph shows about how each girl is paid for her week of work. Include specific mathematical details about hour rate of pay.
3. Miranda also offers babysitting service. She lives on the edge of town and travels by bus to the home where she babysits. Miranda has decided to charge $75 per week for unlimited babysitting. Draw and label Miranda’s line on your graph.
4. Your neighbour needs a babysitter for 15 hours this week. How much would each of three girls charge? Show your work by interpolating on the graph.

Phylida:

Tori:

Miranda:

1. Several neighbours have inquired about babysitters. They have asked you which of the sitters charges the least.

What would your answer to them be? Explain your reasoning and be specific with time intervals.

1. You decided to join the club. You have decided on two things.
* First, you will never work more than 20 hours per week.
* Second, you will always be the cheapest sitter up to 20 hours of work.

Create an equation representing your rate of pay, draw your line on the graph and explain why you are always the cheapest. Use a different colour for your line.