1. The value of a $60 000 car diminishes at a rate of 20% a year. However, the value of a $40 000 truck diminishes at a rate of 10% a year. The two vehicles are going to be sold after 5 years. At resale time, which vehicle will be worth the most?

2. in 2012 there are 1100 students at D’Arcy McGee. Every year the number of students increases by 2%. The number of students at Philemon Wright high school over the past 5 years is shown below.

**# Students at PWHS**

1030

1040

1050

1060

1070

1080

1090

1100

1110

1120

0

1

2

3

4

5

6

**Years since 2007**

**# Students**

The school board states that **“if these trends continue, in the year 2017, Philemon Wright will have more students than D’Arcy.”**

Is this statement correct? Support your answer.

3. A lab technician notes that the number of type A bacteria doubles every hour whereas the number of type B bacteria triples every hour. At the outset (beginning) there are 1000 of type A bacteria and 100 of type B bacteria. Which of the two bacteria will be more numerous after 8 hours?

4. Below is the graphical representation of a wooded lot.

To make a park on this lot, a company has been hired to cut the trees located in the area defined by the inequality . If the company wants $35 for each tree cut, calculate the total cost of cutting the trees in this area.

5. In 1986 the minimum wage in Quebec was $4.35. Since then, the minimum wage has been increasing steadily. Kevin and Samantha have been analyzing the minimum wages over the years and they have come up with two different mathematical models to predict what the minimum wage might be in the future. Kevin thinks the minimum wage increases by 2.9% per year whereas Samantha thinks that it is going up, on average, 17¢ per year.

This situation is represented by the following equations:

Kevin’s rule: 

Samantha’s rule: 

where *x*: represents the number of years since 1986.

and *y*: represents the minimum wage in that year.

**Whose model predicts a higher minimum wage in 2010 and by how much?**

6. Martin, Yves, and Philip want to join Sebastian on a hiking trip planned for October. Sebastian reminds his three friends that they each have to save $400 in 15 weeks.

So far, Sebastian’s friends have saved the following:

|  |  |  |  |
| --- | --- | --- | --- |
| Martin | He has not saved any money yet, but he will get an allowance of $27/week from now until the start of the trip. | | |
| Yves | **Week** | **Amount saved** |
|  | 0 | $150 |
|  | 5 | $225 |
|  | 10 | $300 |
| Philip | He has $950 in the bank but has to spend $35 per week. | | |

**One of Sebastian’s three friends will not be able to save enough money in time for the trip. If they pool their money at the end of 15 weeks, will they have enough money for each to go on the trip?**

7. During a visit to Rouyn-Noranda, you hear that the annual fireworks display will be held at the lake in the centre of town. You decide to attend, and you’d like to have the best possible view of the show. You ask some locals where you should set up your lawn chair.

However, each person you ask has a different opinion about the best location on the city map that you show them.

* Anna says that if you set up at point A: (6, 2), you will have the best view.
* Benny insists that the best place is at point B: (3, 2).
* Charlie tells you it’s at point C: (7, 5).
* Finally, Denis is certain that it is at point D: (-1, 4).

The organizers tell you that some of the fireworks display can be viewed in the region corresponding to  and that the rest can be viewed in the region corresponding to the inequality .

Use this information to determine who is right or wrong, and graphically represent this information.

|  |
| --- |
| **Show your work** |