**K**im and Cyndi are starting a business tutoring students in math. They rent an office for $400 per month and have to pay the tutors $15 per hour for tutoring. If they are able to charge students $40 per student per hour for tutoring, how long will it take for Kim and Cyndi to make a profit?

Let’s break this problem down step by step…

1. What are Kim and Cyndi’s **fixed costs?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. What are Kim and Cyndi’s **variable costs? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

3. Write an equation for the total **expenses (or costs (c))** of the tutoring business for any number of hours (h):

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Complete the following table to determine the expenses Kim and Cyndi would have for their tutoring company.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hours of tutoring (*h*) | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
| Total Expenses (*c*) |  |  |  |  |  |  |  |  |  |

2. Label and scale your graph below using the information above. Graph these points and connect the points.

3. What does the point (0, 400) represent?

4. How much would it cost if they tutored for 15 hours?

5. How much would it cost if they tutored for 550 hours? (Hint: use your formula)

Now that we know how much money they spend, we must now determine the amount of money the tutoring company makes…

6. Write an equation that expresses the **revenue,** or amount of money Kim and Cyndi receive for one student. Let **r** represent revenue and **h** represent the number of hours a student is tutored.

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7. Now let’s fill out a table for the **revenue:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hours of tutoring (*h*) | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
| Total Revenue (*r*) |  |  |  |  |  |  |  |  |  |

8. Graph this information on the same graph on the previous page. Use a different color to represent the **revenue** line.

9. Look now to the graph. Find the **break-even point.** This is the point on the graph where the two lines cross…where the expenses exactly equal the revenue. What is the coordinate of the point?

 ( , )

 What do these two numbers represent?

Now you are able to answer the original question…

10. How long would it take Kim and Cyndi to make a profit?

We can use graphs to help us answer these types of problems if we graph a line for expenses and a graph for revenue. We can also use formulas to help us solve these types of questions.

**Profit = Revenue – Expenses**

If you determine what the revenue would be and the total expenses, you can subtract these numbers to find the profit.

11. If Kim and Cyndi paid $4,000 in expenses one month and brought in $5,200 in revenue, what was their profit for the month?

12. How much profit would they make after tutoring for 550 hours? (HINT: Use your answer from #5 and the revenue formula to help you)