

Cell Phone Company Comparison



iPayNgo

No contracts!
Monthly, pay as you go!
Just charges by the minute!

\$.08 per minute

A family's cell phone contract is up. Now that they can finally change cell phone carriers, they have done some research into sales from different companies.

They have narrowed their search down to two main companies.

Which company seems to offer the better deal? Why?



Cells 4 U

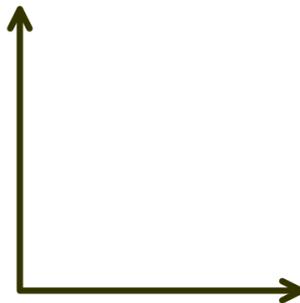
Monthly, pay as you go!

\$.03 per minute*

*After a \$25 monthly fee.

- For each company, write a function rule that determines the total charge for x minutes/data used.
- The family's dad typically doesn't use the cell phone for calls very much. He typically only makes about 180 minutes worth of phone calls.
 - Which company would charge less for this? How much less?
- The family's mother and daughter talk for a combined 1200 minutes monthly.
 - Which company would charge less for this? How much less?
- There is a certain number of minutes per month for which the companies CHARGE THE SAME AMOUNT.
 - Use appropriate tables, graphs, or computations to estimate this value.

| Minutes | iPayNgo | Cells 4 U |
|---------|---------|-----------|
| x | $P(x)$ | $C(x)$ |
| | | |
| | | |
| | | |
| | | |
| | | |



- Use at least two complete sentences and your answer from item #4 to answer the following question:
Which company offers the better deal?

Which company offers the better deal?

Answering this question requires finding the graphical point of intersection, which is also known as the _____ to the _____.

- How can this point be found algebraically (or, without the graph) and exactly (or, without having to estimate)?

We must turn the _____ equations into _____.

Cost at iPayNgo = Cost at Cells 4 U

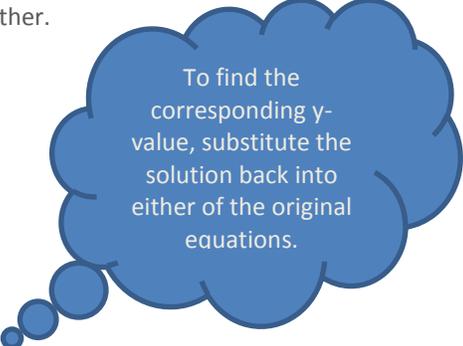
$$P(x) = C(x)$$

=

← Set the cost functions equal to one another.

← Rewrite in terms of x .

← Solve.



To find the corresponding y -value, substitute the solution back into either of the original equations.

Use a similar method to solve these systems algebraically.

6.

$$\begin{aligned} y &= 2x - 3 \\ y &= 4x + 7 \end{aligned}$$

7.

$$\begin{aligned} y &= -3x + 8 \\ y &= 9x - 15 \end{aligned}$$

8.

$$\begin{aligned} y &= 15 + 36.5x \\ y &= 60 + 28.5x \end{aligned}$$

SOLVING BY SUBSTITUTION

- When one equation is in intercept form
 - $\begin{cases} y = 15 + 8x \\ -10x - 5y = -30 \end{cases}$ ← The first equation is in intercept form

Solve these systems of equations by the substitution method.

9.

$$\begin{aligned} y &= 7x - 20 \\ 8x + y &= 235 \end{aligned}$$

10.

$$\begin{aligned} x &= 6y - 11 \\ -2y - 3x &= -7 \end{aligned}$$

11.

$$\begin{aligned} -4x + y &= 6 \\ -5x - y &= 21 \end{aligned}$$

SOLVING BY ELIMINATION

- The goal with this method is to completely *eliminate* one of the variables.
- When variables have the same coefficient

Solve these systems of equations using the Elimination method.

12.

$$4x + 3y = 14 \quad 3x - 3y = 13$$

13.

$$\begin{aligned} -3x + 5y &= 6 \\ 2x + y &= 6 \end{aligned}$$

How do you think the following systems can be solved? Find the solutions.

14.

$$\begin{aligned} 8x - 6y &= -20 \\ -16x + 7y &= 30 \end{aligned}$$

15.

$$\begin{aligned} 4x + 2y &= 10 \\ x - y &= 13 \end{aligned}$$

16.

$$\begin{aligned} -4y - 11x &= 36 \\ 20 &= -10x - 10y \end{aligned}$$

17.

$$\begin{aligned} x + 3y &= -1 \\ x &= 2y + 4 \\ 9x - 5y + z &= 36 \end{aligned}$$