Linear Systems - Graphing

**WARM UP: Intersecting Lines**

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| car clipart taxiGo-Go Taxi charges $5 to ride their taxi plus $0.30/km. Take-Me-There Taxi charges $8 to ride, plus $0.20/km. Express each scenario as a linear equation, where *x* represents the number of kilometres and *y* represents the total charge. |

 **Go-Go Taxi:** *y* = \_\_\_\_ *x* + \_\_\_\_

 **Take-Me-There Taxi:** *y* = \_\_\_\_ *x* + \_\_\_\_

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| http://t1.gstatic.com/images?q=tbn:ANd9GcScy7LsBXdnU0ZXuyZawDGiuEWyk6-YmHd5yWV15gkzkDqVa77DyQDownload **DESMOS** app or go to www.desmos.com  |

1. Using the graphing calculator, sketch the two graphs on the grid provided.

2. Touch/click on the point of intersection (P.O.I) and determine the coordinates. Label this point on your graph.

A linear system:

 ① y = 0.30x + 5

 ② y = 0.20x + 8

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| **KEY CONCEPTS*** When 2 or more equations are used to model a problem, it is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_

 \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_. A system of linear equations is simply 2 or more lines intersecting \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A linear system with two unknowns  consists of 2 (or more) \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ involving 2 variables. * A solution to a linear system is an \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, that satisfies (LS=RS) all the equations in the system.
* If there is a single solution to the linear system, it is represented by the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the 2 lines.
* There are several methods to solve linear systems: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

**Method 1: Guess and Check**

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| To determine whether a point (x, y) is a solution to a linear system using this method, the x and y values must be substituted into the left and right sides of both equations. If \_\_\_\_\_\_\_\_\_\_ for both equations, then (x, y) is a solution. |

**Ex1**. Determine whether (30, 14) is a solution to the linear system above.

**Method 2: Graphing**

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| To determine the solution to a linear system using this method, both lines are graphed and the solution is the point of intersection (x, y) of the two lines. Solutions found using this method must be checked by substituting the x and y values into the left and right sides of both original equations. |

① y = 3x + 1

② 6x + 3y = -12

**Ex2**. Find the solution to the linear system below by graphing.

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The P.O.I is ( , )

**Check solution in left and right sides of both equations:**

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| Equation ① y = 3x + 1 |  | Equation ② 6x + 3y = -12 |
| LS | RS |  | LS | RS |
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Exit Card: You want to join a gym to get physically fit. URFIT charges a $400 membership fee, plus $25 for each personal training session. FABFITNESS charges a $200 membership fee, plus $50 per personal training session.

1. For each gym, **write an equation** to represent the cost of belonging to each gym.

Use **C** to represent the cost, and **p** to represent the number of personal training sessions.

URFIT: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FABFITNESS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Graph** both relations on the same set of axes below.

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1. **State the point of intersection** and **explain the meaning** of th point.

1. Your friend wants to join a gym too.

**What advice** would you give to

 your friend?