

## Section 6.7 - Linear Systems

MPM1D

Jensen

**Linear System:** A set of two or more linear equations that are considered simultaneously

**Point of Intersection:** the point where two or more lines intersect

### DO IT NOW!

Mike is considering joining a ski club for the winter season. He is considering the following two options:

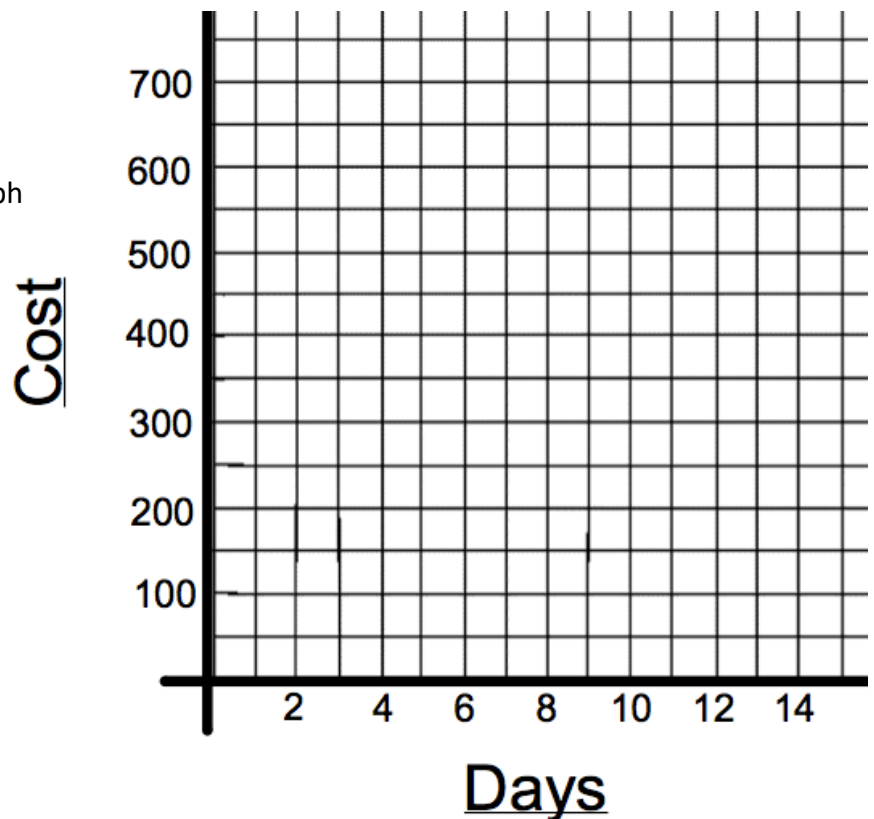
**Standard Rate:** \$50 per day and no registration fee

**Frequent Skier Pass:** \$40 per day and \$100 registration fee

a) Write an equation that relates the total cost,  $C$ , in dollars, and the number of days,  $n$ , that Mike goes skiing if he chooses the **Standard Rate**:

b) Write an equation if he chooses the **Frequent Skier Pass** option:

c) Graph both of the lines on the same graph



**d)** What is the point of intersection?

**e)** What is the cost of both plans at the point of intersection? What does this mean?

**f)** Look to the right of the point of intersection, which plan is cheaper?

**g)** Look to the left of the point of intersection, which plan is cheaper?

**h)** If Mike is going to go skiing 11 times this winter, which plan would you recommend to him?

**Example 1:** Graph  $y = \frac{1}{2}x - 3$  and  $x + y = -6$  on the same grid and identify the coordinates of the point of intersection.

Line 1:  $y = \frac{1}{2}x - 3$

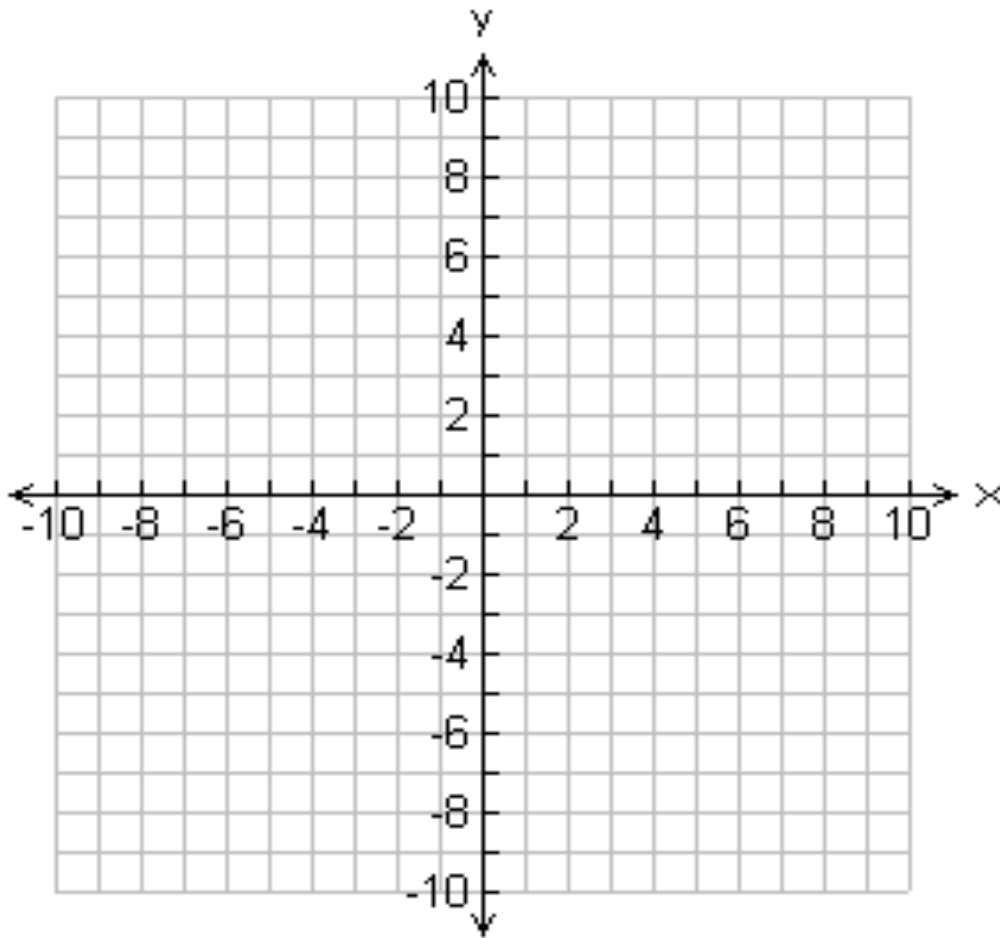
Line 2:  $x + y = -6$

Slope:

Slope:

y-intercept:

y-intercept:



Point of Intersection: \_\_\_\_\_

**Check your answer:** To verify the solution, (-2, -4), substitute the coordinates into both equations and check that they hold true. Use the left side/right side method.

Check:  $y = \frac{1}{2}x - 3$

L.S.

R.S.

Check:  $x + y = -6$

L.S.

R.S.

**Example 2:** Graph  $y = 2x - 2$  and  $y = x + 1$  on the same grid and identify the coordinates of the point of intersection.

Line 1:  $y = 2x - 2$

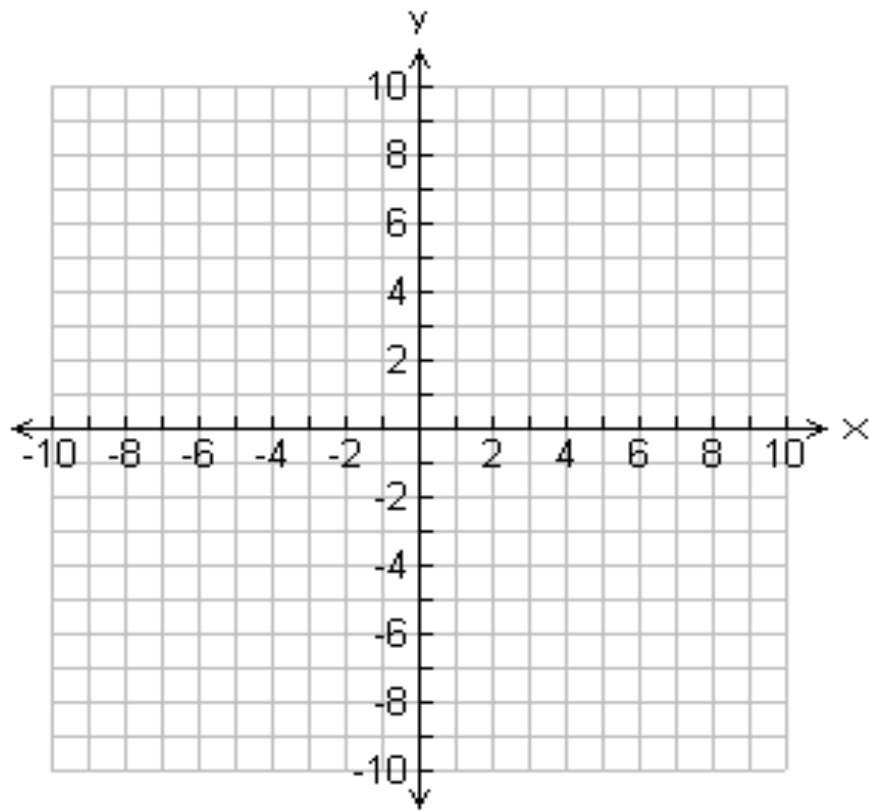
Line 2:  $y = x + 1$

Slope:

Slope:

y-intercept:

y-intercept:



**Point of Intersection:** \_\_\_\_\_

**Check your answer:** To verify the solution, (3,4), substitute the coordinates into both equations and check that they hold true. Use the left side/right side method.

Check:  $y = 2x - 2$

L.S.

R.S.

Check:  $y = x + 1$

L.S.

R.S.