

From Mrs. Young's Trigonometry Students Ski Slope Diaries

In December, as the first snows of winter were falling in the mountains nearby, Mrs. Young was reviewing math slopes with 11th graders before their test. The students were, of course, thinking about the ski slopes instead of math slopes.

Inspired by the Diary of a Worm assignment at WritingFix, Mrs. Young assigned the students to each create "Ski Slope Diaries." As a review for their upcoming test, each student created an imaginative 7-day diary of someone who was on a skiing vacation. Each diary entry needed to make reference to one of the slope equations the students had learned about, and they had to somehow apply their learning to what might happen on a ski slope.

Below, find three example entries from three different students. With a partner, discuss a) where these students successfully applied the knowledge they had learned and b) other ways you could use creative diary entries to have students apply mathematical knowledge.

December 11,

Dear Diary,

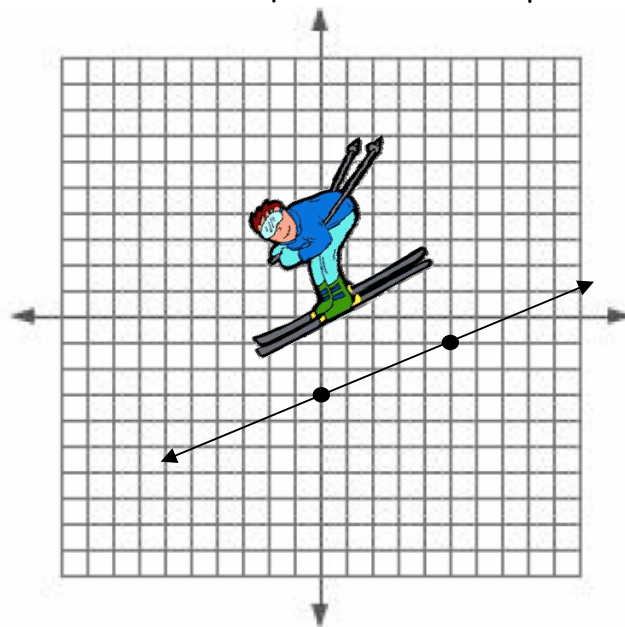
So I finally made it up the slopes with my family and friends and was ready to head down the hill. Unfortunately, my father who majored in physics and mathematics forced us to understand the slopes before we could have fun. He told us the equation he came up for the slope was $2/5x - y = 3$, and in order to ski, we had to find the **slope-intercept form**. Luckily for me, I remembered the slope-intercept form was $y = mx + b$, and $m = \text{slope}$ and $b = \text{y-intercept}$.

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

$$\begin{aligned}\text{slope} &= 2/5 \\ \text{y-intercept} &= -3\end{aligned}$$



(from the slope diary of Nicholas S., 11th grade)



December 12,

Dear Diary,

My brother and I decided to race down one of the ski hills. We were afraid to run into each other though. So we promised to ski in **parallel lines** to avoid collision. The lines that we ski in never cross each other's paths, but they are still on the same ski run. It's fun and safe.

Then we decided to try it again and go on the same path, one after another. These paths were **coinciding**, meaning the lines ended up being on top of each other.

Two Parallel lines:

$$y = -1/2x - 5$$

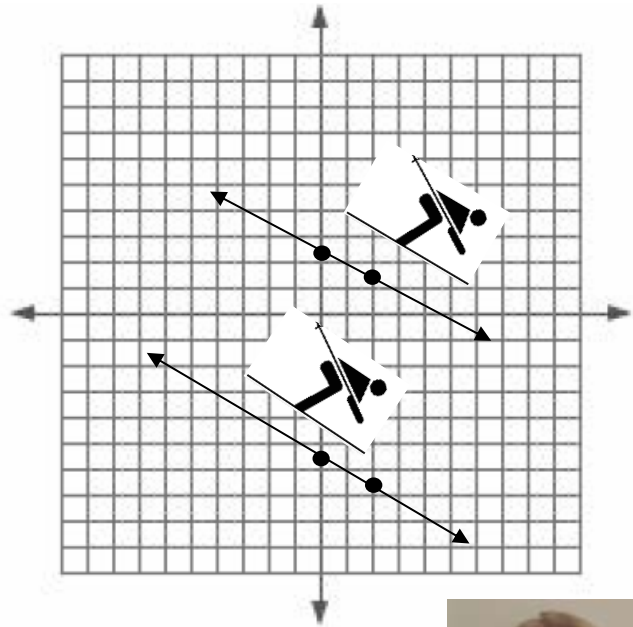
$$y = -1/2x + 3$$

Coinciding lines: example

$$5x + 9y = 14 - 5x$$

$$y = -5/9x + 14/9$$

(from the slope diary of Nichole W., 11th grade)



December 13,

Dear Diary,

The slopes weren't as much fun as yesterday. I fell a lot. The problem was that my skis kept crossing and making perpendicular lines, causing me to crash. Perpendicular is when lines make a right angle, and the equation is a flipped negative of the parent equation. Let's hope for better luck tomorrow!

Perpendicular lines example:

$$y = 1/2x + 3$$

$$y = -2x + 3$$

(from the math diary of Samantha J., 11th grade)

