Lesson Objective: Students will write vector equations of lines given a point and a slope or two points, and express results in both parametric and vector form.

Problem 1 (Vector Equation)

- Find the Vector equation for a line that has:
- Slope $\frac{2}{3}$ and passes the point $(1, -5)$

Problem 2 (Vector Equation)

- Find the Vector equation for a line that has:
- Slope 4 and passes the point $(-2, 3)$

Problem 3 (Vector Equation)

- Find the Vector equation for a line that has:
- $(-4, 2)$ and $(2, 6)$

Lesson Objective: Students will calculate the magnitude (length) of vectors given two points using the distance formula.

Problem 1 Find the length of vector $\overrightarrow{AB}$

Point A: $(2, -5)$ and Point B $(3, 4)$

Problem 2 Find the length of vector $\overrightarrow{AB}$

Point A: $(0, 0)$ and Point B $(2, 5)$

Rewriting parametric equations as Cartesian Worksheet

1. Eliminate the parameter and write as a Cartesian equation solved for y.

   $x(t) = 2t - 2$
   $y(t) = -4 + t$

2. Eliminate the parameter and write as a Cartesian equation solved for y.

   $x(t) = 2t - 4$
   $y(t) = 1 + 2t$

3. Eliminate the parameter and write as a Cartesian equation solved for y.

   $x(t) = -5t - 3$
   $y(t) = 4 - 5t$

4. Eliminate the parameter and write as a Cartesian equation solved for y.

   $x(t) = -4t - 2$
   $y(t) = -4 - 2t$

Lesson Objective: Students will compute the dot product of two vectors and use it to determine the angle between them in two dimensions using the cosine formula.

Problem 1 (Dot Product)

- Given: $a = \langle 3, 5 \rangle$ and $b = \langle -2, 4 \rangle$
- Question: Find the dot product of $\vec{a} \cdot \vec{b}$
- Question: Find the angle between vector a and b

Problem 3 (Dot Product)

- Given: $a = \langle -4, 7 \rangle$ and $b = \langle 1, -2 \rangle$
- Question: Find the dot product of $\vec{a} \cdot \vec{b}$
- Question: Find the angle between vector a and b

Formula for WORK: $W = F \cdot d \cdot \cos\theta$

A heavy bag is dragged 10 feet across the floor, using 85 pounds. Find the work done if the direction of the force is $60°$ above the horizontal.