1. If a vector starts at the point $(3, -7)$ and terminates at the point $(14, 5)$, what is the tangent of the angle this vector makes with the positive $x$ axis?

2. A flea is on a cat. If the cat goes 5 feet in a direction $30^\circ$ (measured counter clockwise from the positive $x$ axis) and the flea then gets off the cat and goes 1 foot in a direction of $90^\circ$ with respect to the positive $x$ axis, what are the locations of the flea and the cat?
3. If the product of a vector \( \mathbf{x} \) with the number 3 is equal to \( \langle 4, 15 \rangle \), what is \( \mathbf{x} \)?

4. Find \( a \) which satisfies \( a \langle 3, 4 \rangle = \langle -15, -20 \rangle \).

5. For each of the following draw the vector, and then draw the result of the scalar product.
   (a) \( 2 \langle -1, -1 \rangle \)
   (b) \( -3 \langle -1, 2 \rangle \)
6. Find all vector \( \mathbf{x} \) which satisfy the vector equation \( 2\mathbf{x} + 5 \langle 1, -2, 4 \rangle = \langle 5, 12, 17 \rangle \).

7. For each of the following draw the individual vectors, and then draw the result of the vector addition.

   (a) \( \langle 1, -1 \rangle + \langle 2, 5 \rangle \)
   
   (b) \( \langle -1, 2 \rangle - \langle -2, -3 \rangle \)
8. For each of the following pairs \( \mathbf{x} \) and \( \mathbf{y} \) compute \( 2\mathbf{x} + 3\mathbf{y} \).
   
   (a) \( \mathbf{x} = \langle 1, 2 \rangle \), \( \mathbf{y} = \langle -1, 2 \rangle \)
   
   (b) \( \mathbf{x} = \langle -3, 2, 5 \rangle \), \( \mathbf{y} = \langle 5, 1, -4 \rangle \)

9. Compute the lengths of the following vectors.
   
   (a) \( \langle 2, 3 \rangle \)
   
   (b) \( \langle 2, 3, -5 \rangle \)

10. An airplane flies from the point \((1, 1, 3)\) to the point \((5, -5, 0, 1)\). Once again the unit distance is one mile. If it takes the plane 4 minutes to make this descent, how fast is the plane descending in miles per hour?
11. For each of the vectors given, find a unit vector which points in the same direction as the vector.
   
   (a) \( \langle 1, 2 \rangle \)
   
   (b) \( \langle 2, 3, -5 \rangle \)

12. Compute the dot product for the following pairs of vectors.

   (a) \( \langle 1, 2 \rangle , \langle 3, -7 \rangle \)
   
   (b) \( \langle 2, 14, 5 \rangle , \langle -2, 0, 7 \rangle \)

13. Find all unit vectors that are perpendicular to the vector \( \langle 2, -3 \rangle \).
14. Find the angle between the following pairs of vectors.

(a) \(\langle 1, 1 \rangle, \langle 9, -4 \rangle\)
(b) \(\langle 2, 3, -8 \rangle, \langle 2, 2, 13 \rangle\)