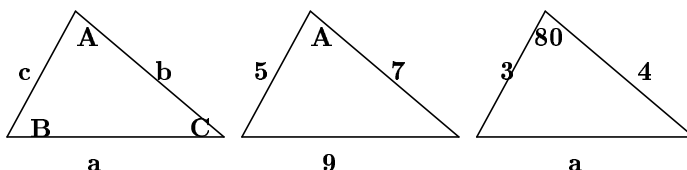


Merit Workshop 1 - 24 August, 2005

Sometimes we will begin with a little information that you will need for your next Math 242 lecture.

1. **Cosine Rule:** $a^2 = b^2 + c^2 - 2bc \cos A$



What are a and A ? Many different angles have the same cosine (examples?) - how do you know that you have the right one?

- List 5 things best described by using scalars and 5 things best described by using vectors.
- Use vectors to describe the position of some of the objects in the Merit workshop room.
- A line segment starts at $(2, -7)$ and has midpoint $(5, -1)$. What is the other endpoint of the line segment?
- A line segment starts at $(1, 3)$ and ends at $(4, 7)$. Where would it end if it was 5 times longer?
- Given the vectors $\mathbf{b} = \langle 1, 1 \rangle$ and $\mathbf{c} = \langle -1, 2 \rangle$, for the following vectors \mathbf{a} , find s and t such that $\mathbf{a} = s\mathbf{b} + t\mathbf{c}$.
 - $\mathbf{a} = \langle 0, 6 \rangle$
 - $\mathbf{a} = \langle -3, 6 \rangle$
 - $\mathbf{a} = \langle 0, 0 \rangle$
 - Choose your own vector \mathbf{a} .
 - What does this tell you about any vector \mathbf{a} in \mathbb{R}^2 ?
- If a, b and c are the vertices of a triangle, find $\vec{ab} + \vec{bc} + \vec{ca}$.
- What is the domain of $\log(x^2 - y^2 - 1)$?
- How does the function $f(x, y) = x^2 + y^2$ behave?

Warm-Up problems for next week

- What is the distance between $(-1, 3, 7)$ and $(2, -1, 19)$?
- What is $\|7\mathbf{i} + 9\mathbf{j} - 9\mathbf{k}\|$?