

General Purpose ITS Development Tools

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Workshop on
**Intelligent Tutoring System
Authoring Tools**

- **Key Characteristics**
 - Problem-solving based learning activities
 - Domain Independent
 - Extensible
 - Web-based deployment accessible over multiple devices

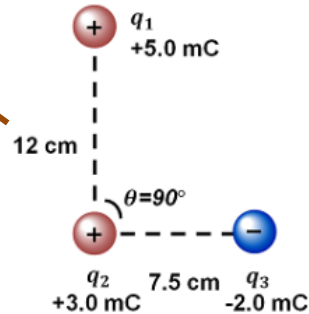
- **Supports multiple types of users**
 - **Learners**
 - Learning Environment
 - **Teachers**
 - Managing Assignments & Reports
 - **Content Developers**
 - Tools for creating and managing problems

Problem Statement

Student allowed to solve the problem at any time

Force on one particle by two other particles

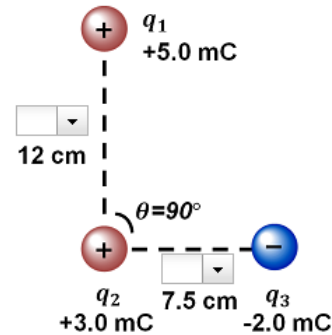
Three charged particles are located according to the diagram below. What is the net force on the $+3.0 \text{ mC}$ particle?



- A. $1.3 \times 10^7 \text{ N}$; 44° North of East
- B. $1.3 \times 10^7 \text{ N}$; 44° South of East
- C. $1.3 \times 10^4 \text{ N}$; 44° North of East
- D. $1.3 \times 10^4 \text{ N}$; 44° South of East

Submit Answer

Label the diagram



1/6

Help

Hints & Feedback

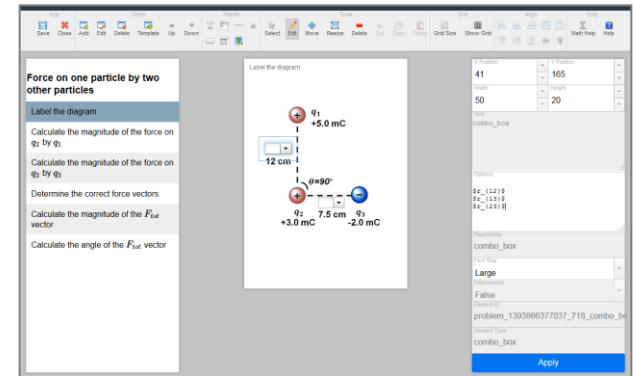
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Solution Steps

Offered when student asks for help, Leads students through a good way of solving the problem

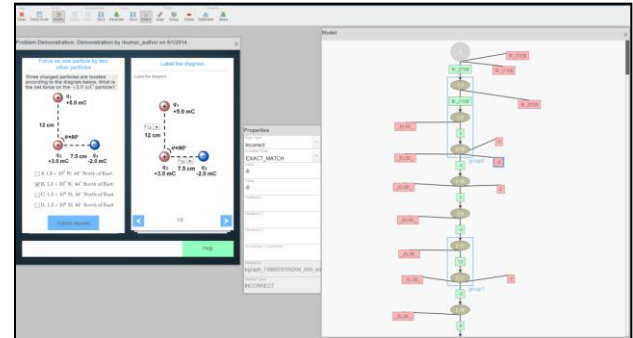
- **Author App**

- Used to create new problems and the corresponding user interfaces to provide guided solutions to the problem



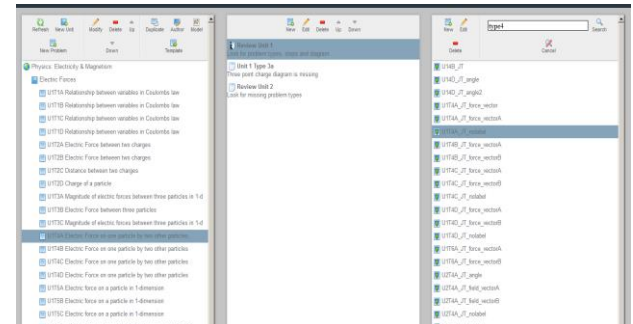
- **Model App**

- Uses a programming-by-demonstration approach to facilitate the development of example-tracing tutor models



- **Administrate (Build) App**

- Functions as a dashboard to manage curriculum, problems and resources (e.g. images)



- **Web-based Deployment**
 - Facilitates wide access & rapid dissemination of updates
 - Centralized data repository
- **Familiar UI Metaphors**
 - Problem steps as tiles (Flash card, Powerpoint)
 - WYSIWYG, Properties panel, Tags
- **Templates**
 - Reduces authoring effort by enabling content re-use
 - Future Work: Parameterization
- **Automation**
 - Generating Tutor Models using Multiple Demonstrations
 - Papers in ITS2014, EDM2014
- **Collaboration**
 - Shared content repository
 - Automated version management (behind the scenes)
 - Future Work: Locks

- **Content Development Process**
 - Problem/Steps are designed & authored (**Author** App)
 - Solution(s) are demonstrated (**Model** App)
 - Tutor Model is generated & annotated (**Model** App)
 - Iterative process (interleaved reviews)
- **Prototype Learning Domain**
 - High-School Physics: **Electricity & Magnetism**
- **Live System**
 - Being actively used by two content developers
 - >100 problems authored, model development underway
 - Yet, actively under development