

37th AMATYC Annual Conference in Austin, TX

Tablet PCs: A Tool for Instructional Collaboration

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Tablet PCs: A Tool for Instructional
Collaboration

Overview

- Every student can “come to the board” in a collaboratory class without ever leaving their seat (or even coming to campus).
- This presentation will explain the steps to create a collaboratory session using free software and linked computers.
- We will show how to enhance a basic collaboratory session through the use of tablet PCs and interactive classroom software.

Everybody check-in

Capabilities

- Multi-directional exchange of information asynchronously
 - Students write on their respective screens.
 - They submit work to the instructor, or the instructor can collect it from them.
 - The instructor can annotate their work orally or in writing, and provide feedback during or after class.
- Students can play back their personalized version of the class synchronized with audio.

Capabilities

- Students can add private notes and scratch work to a collaboratory session and can print or share portions after class.
- Students can work in virtual groups and submit their results electronically, which is then returned to each group member.

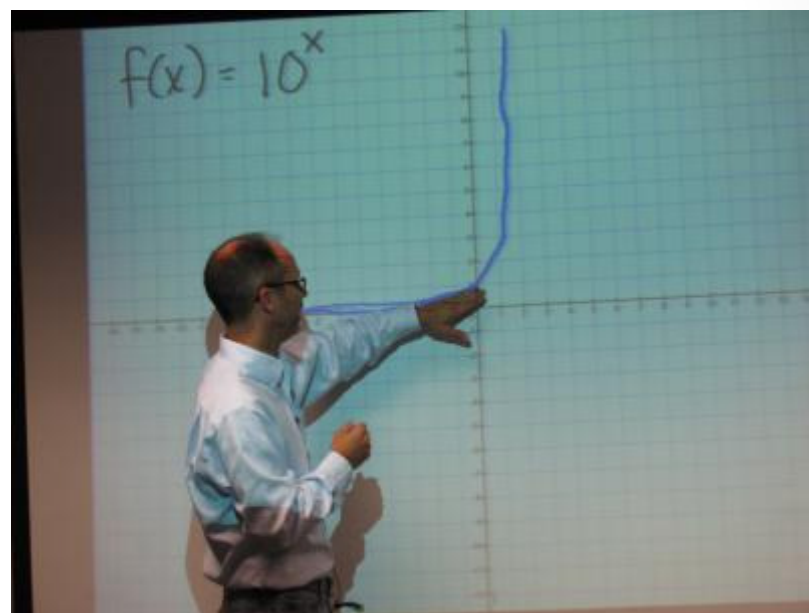


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Pedagogical Advantages

- Facilitates...
 - Student participation,
 - Formative and peer assessment, and
 - The student's contribution to the learning experience.
- Extensions of this approach include hybrid and online instruction.



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Mike's pedagogical progression

- Share notes with students
- Capture classes for students
- Increase student engagement
- Increase student contributions
- Improve student problem solving



Source: Rapid City, SD (circa 2011)

What do we mean by problem solving? A la Polya...

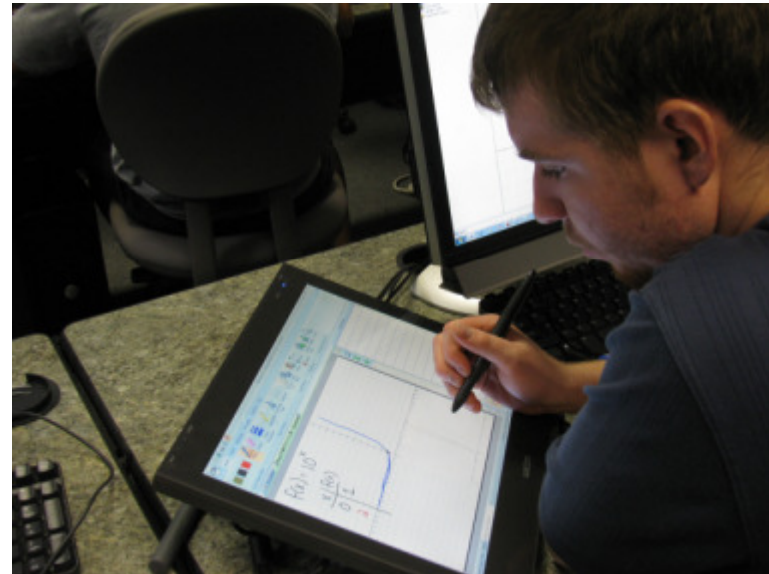
- Understand the problem.
- Develop a plan.
- Carry out the plan.
- Look back (reflect).



Source: Rapid City, SD (circa 2011)

Let's dive in...

- Create a Collaboratory
 - Where each student in the class "comes to the board" and participates
 - Back to the days of slate
 - Flip the classroom; read (or watch) at home, work in class



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Today

- Available tools are...
 - Polling
 - Whiteboards
 - Chat
 - Student status
 - Online distribution of content
 - Audio-video capabilities



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Time savings allows for high-level tasks

- You want to do what? Write on a board and erase it?
 - Students can participate and contribute
 - Receive summative and formative assessment
 - Watch lectures as homework
 - Class time on problem-solving/critical thinking development

Time savings allows for high-level tasks

- Mastery dilemma: Relies on “taking your time”
 - Logistical Issues – Delivery of material to students when they’re at different mastery levels
 - Assessment Issues – Versions of assessments for test integrity



Time savings allows for high-level tasks

- Implications for All Modes of Instruction
 - Traditional
 - Hybrid
 - Online

How to Create a Collaboratory

- Ideal Tools
 - Computer (Tablet PC or Monitor)
 - Microphone
 - Projector(s)
 - Software Program for Collaborating
 - Screen Capture Software



Source: Doolittle, R. Rochester Institute of Technology

How to Create a Collaboratory

- Software Programs for Collaborating
 - Classroom Presenter
 - Interactive Classroom
 - OneNote
 - DyKnow



Source: Harms, D. CompSysTech 2007

How to Create a Collaboratory

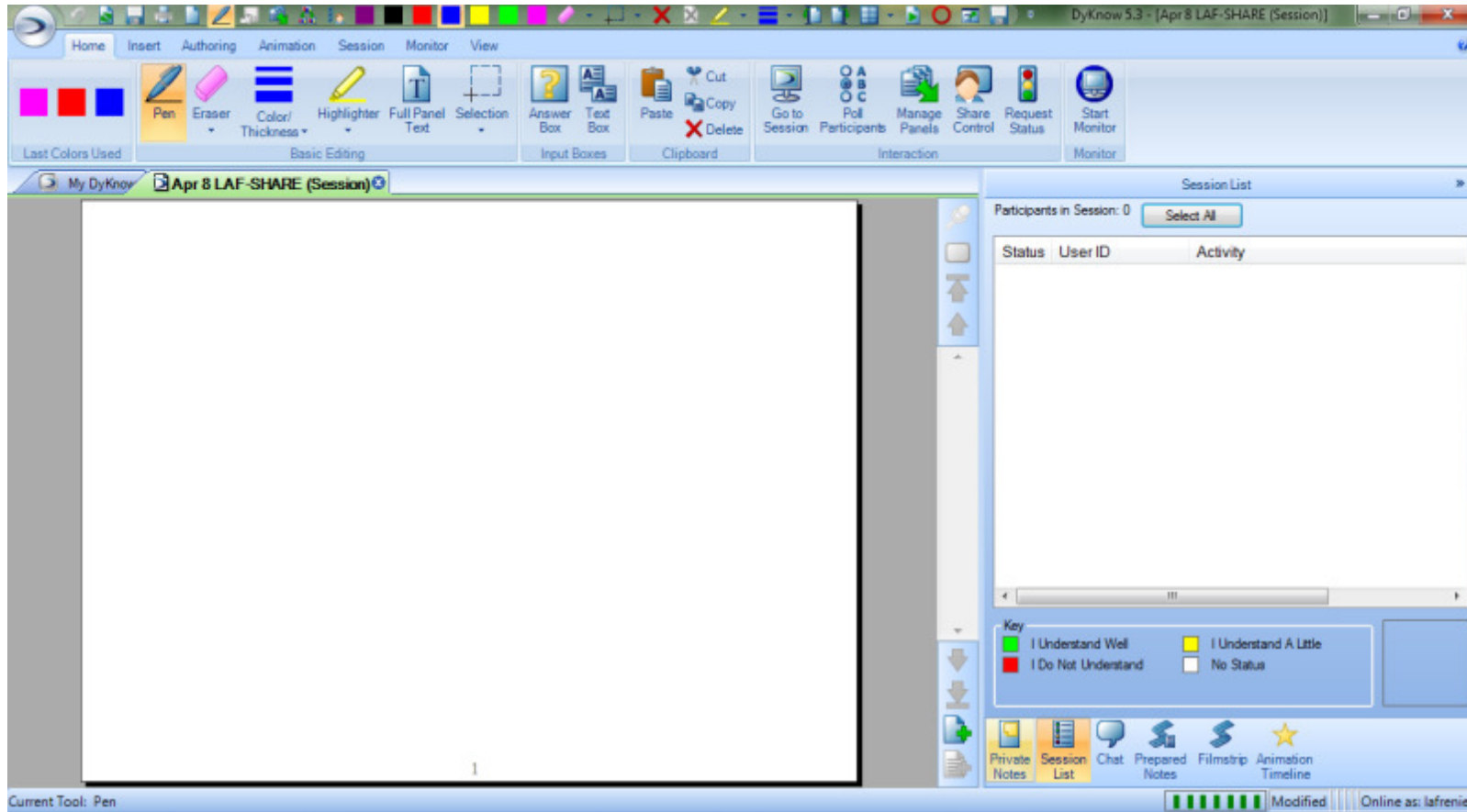
- Screen Capture Software
 - Camtasia Studio
 - Jing
 - Adobe Connect
 - uStream.tv

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DyKnow Software



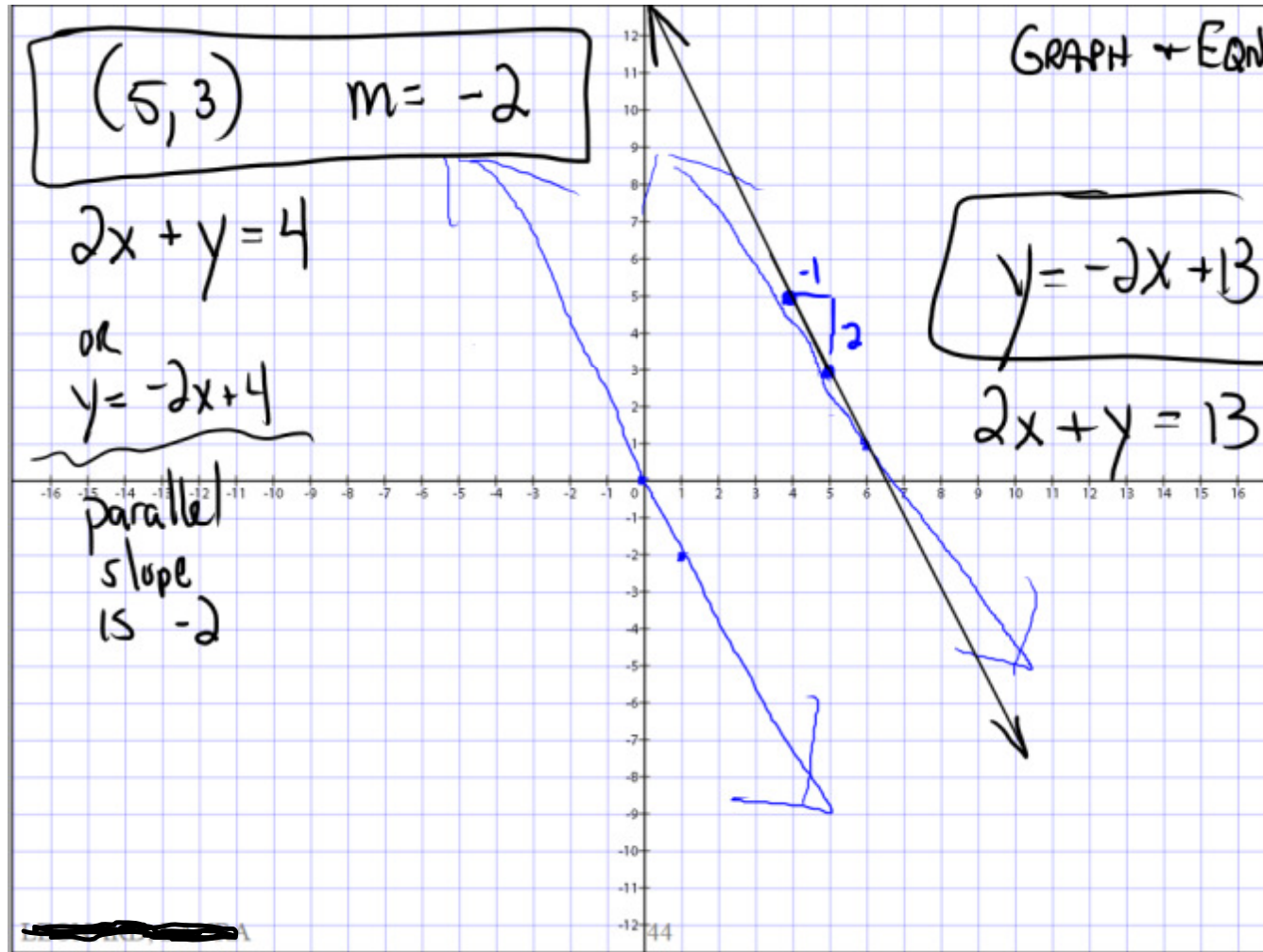
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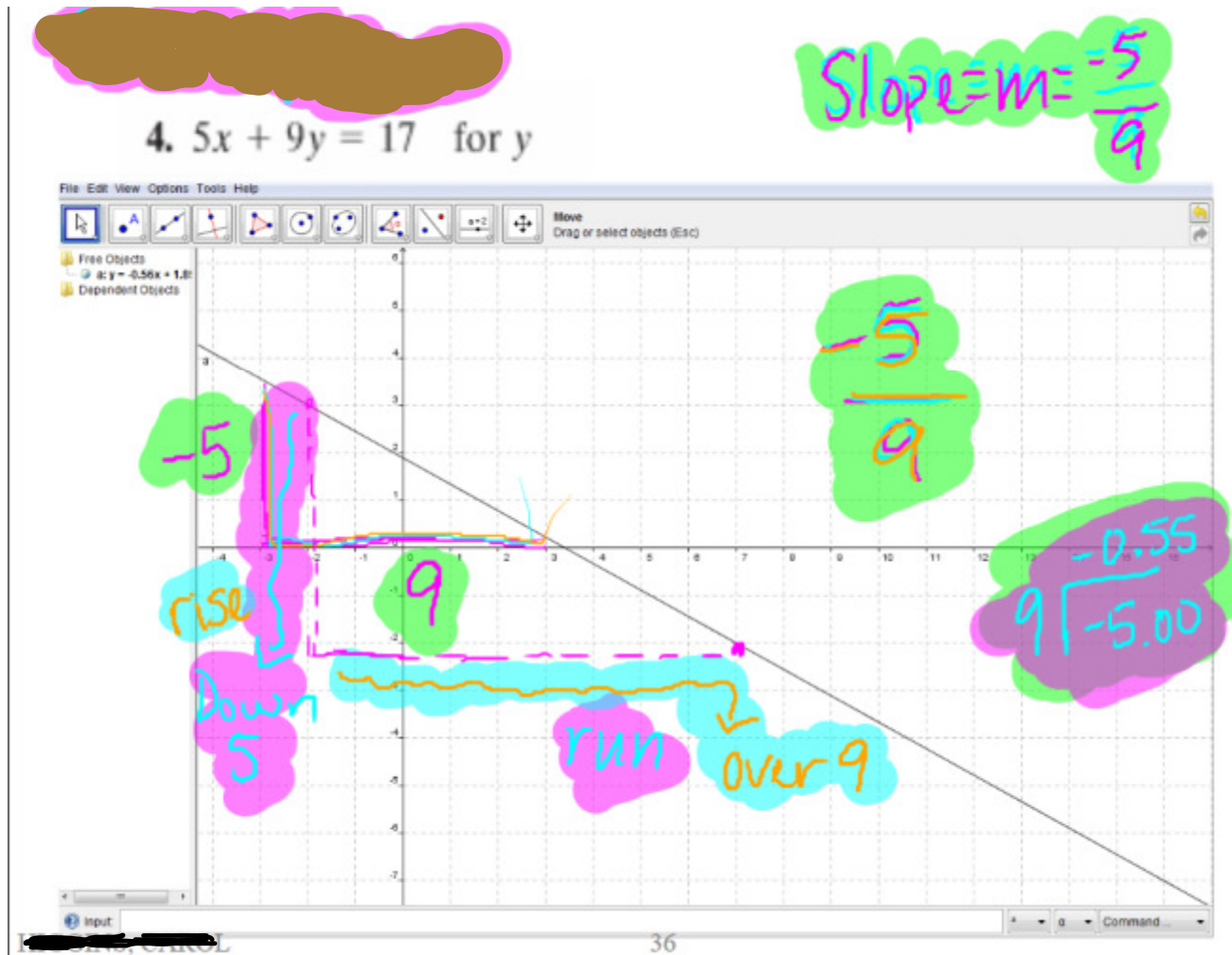
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Graphical Utility of Collaboratory



Sample of Student Work

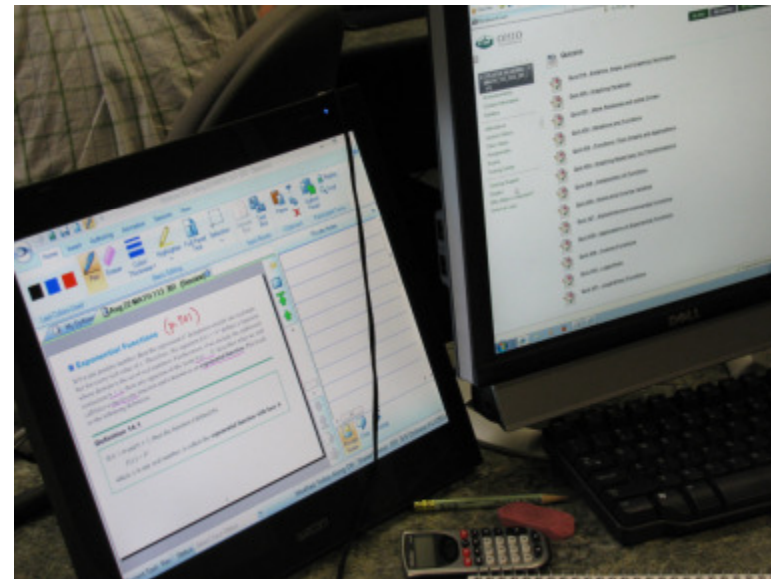


Other Applications

- Some Examples
 - Illustrations of sequences with animated timelines
 - Inclusion of Interactive Websites
 - Emulations and Virtual Control Simulations
- Problem Analysis
 - Solve a problem incorrectly on a panel
 - Students replay and determine error(s)
 - Students recreate problem accurately or explain the error(s)

Other Applications

- Reflection of Problem Solving
 - Animated replay of student work
 - Able to see student's sequencing
- Group Work
 - Create Student Legend – Different Color Ink
 - Replay their contributions



Benefits of a Collaboratory

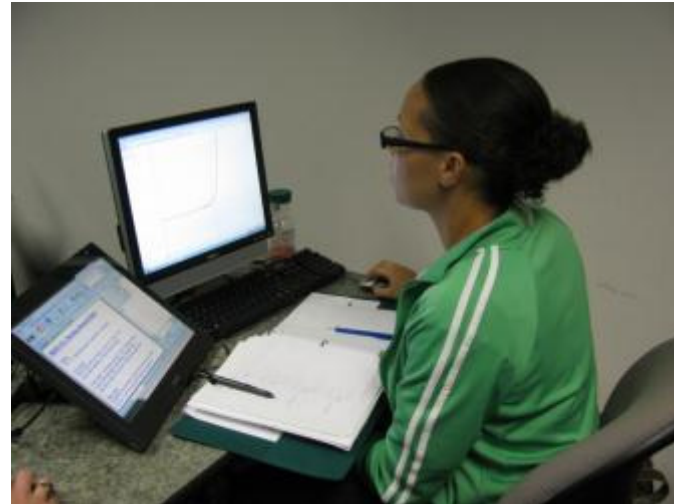
- Increased engagement and participation from students
- Model for other classrooms
- Lectures assigned as homework
- Group work, formative assessment, self-reflection occurs during class time with instructor serving as a collaborator.

Benefits of a Collaboratory

- Broadcast and synchronize with online and in-class students (increased capacity)
- Mastery level learning - allow for slight variations in learning pace and multiple attempts to demonstrate learning asynchronously
- Note taking is collaborative

Benefits of a Collaboratory

- Able to archive student learning for portfolio creation, accreditation
- Training space for faculty to learn online/classroom technologies (Faculty "sandbox")?
- Researcher Tool (for collecting qualitative information)



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Next Steps

- Tutoring Applications
 - Online Support
 - Peer Tutoring and Collaborative Workspaces
 - Handwriting Recognition for Self-Evaluation
- Assessment Applications
 - Combine with Online Homework Tools
 - Handwriting Recognition for Teacher Grading (FluidMath)

Links

- DyKnow Vision
 - www.dyknow.com
- Screen Capturing
 - www.screencast-o-matic.com
 - www.techsmith.com/camtasia
- Streaming Video
 - ustream.tv
- Classroom Presenter
 - classroompresenter.cs.washington.edu

Links

- Microsoft Interactive Classroom
 - PowerPoint and OneNote Add-in
- Adobe Connect
 - www.adobe.com/products/adobeconnect.html
- Online Whiteboards
 - scriblink.com

Activities

Sample Exercises for Procedural Understanding

- Graphing ordered pairs (x, y)
 - Instructor encircles for feedback
- Determine Slope
 - Given Two Points
(use ruler on screen in DyKnow & GeoGebra)
 - Given Equation
- Graphing Linear Equations via Various Methods
(instructor overlays answer for feedback)
 - Given Two Points
(use ruler on screen in DyKnow & GeoGebra)
 - Given Point and Slope
 - Given Equation

Source: Assessing the Strands of Student Proficiency in Elementary Algebra by William G. McCallum (May, 2005) MSRI Publications – Volume 53 - Assessing Mathematical Proficiency, Edited by Alan H. Schoenfeld

Sample Exercise for Conceptual Understanding

- Assuming a is positive, what is the effect of increasing a on the equation of the line?

$$y = x - a$$

$$y = a x$$

$$y = a$$

$$y = (1/a) x$$

Source: Assessing the Strands of Student Proficiency in Elementary Algebra by William G. McCallum (May, 2005) MSRI Publications – Volume 53 - Assessing Mathematical Proficiency, Edited by Alan H. Schoenfeld

Sample Exercise for Modeling

The total cost of ownership of an inkjet printer, C , is a function of n , the number of 8"x10" color photos printed. Express C as a linear function of n for the following printers:

HP Deskjet 6540 costs \$130 and the cost per photo is \$1.15

Canon Pixma iP8500 costs \$345 and cost per photo is \$0.95

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