on, and subsequent events have only proved him right. Yet, he spent virtually no time considering the plight of minor nationalities in any meaningful sense.

What Bismarck proposed for the partitioning of the Ottoman Empire, too, shows his sense of history. However, he also chaired the Congress of Berlin of 1884 to partition Africa between the European colonial powers. Bismarck's strong belief in balancing the European powers to maintain the peace and, as far as Germany was concerned, to stand well with Russia, further conform his wisdom. Kaiser William II, who refused to be tutored by Bismarck, antagonized Russia, Britain, and France; went to war in 1914; and ruined Germany. Hitler too committed the same blunder – fighting a two-pronged war.

Space will not permit us to discuss other issues that Taylor raises. But what has been reviewed so far in the realm of diplomacy should be enough to show how Bismarck used foreign affairs to achieve domestic objectives. His statesmanship further lies in cooperating with the liberals and socialists to initiate a series of administrative reforms for Germany. These include: the creation of a common currency, a central bank, and single code of commercial and civil law. He was also the first statesman in Europe to devise a comprehensive scheme of social security, offering workers insurance against accident, sickness, and old age. In conclusion, one can only say that Professor A.J.P. Taylor has written an admirable work.

Biographical Sketch

Daniel Kendie teaches upper level classes in African History, the Modern History of the Middle East, and the History of Modern Russia, as well as survey courses in World Civilization and Introduction to Philosophy. He has published two books and is working on two others.

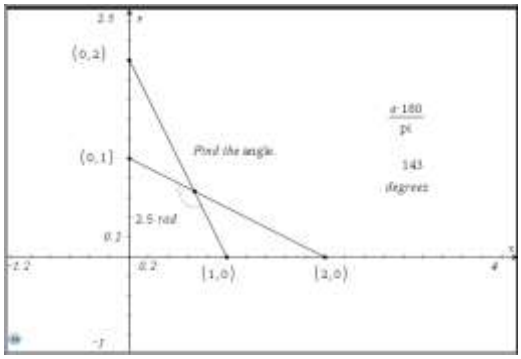
Geometrical Solutions using the TI-nspire

Michael Lloyd, Ph.D.
Professor of Mathematics

In this paper, techniques will be introduced using the geometry feature on the TI-nspire calculator or software for solving a sample of pre-calculus, trigonometry, and calculus problems. Most of the constructions in this paper should be possible using Geometer's Sketchpad computer software, or the Cabri geometry application on the TI-83+/84+/89. [T] Some instructors may be concerned that a student could cheat by simply constructing it geometrically instead of using the techniques explained in the classroom. However, I would be impressed with such a student since I have never seen a student do this, and I would not deduct any points as long as his or her explanation was complete. Nonetheless, there is a press-to-test mode on the TI-nspire and TI-83+/84+ calculators that can disable the geometry and other features. [T]

A Triangle Problem on the Praxis

This problem was brought to my attention by one of our secondary mathematics education majors who was preparing to take the Praxis examination. She was presented with the two right triangles as drawn here, and then asked to find the angle as shown in the diagram. Although there is a pure geometric application on the TI-nspire, it is usually easier to open a geometry/graphs application and use the scales on the axes. After the figure is created, the student can tap on the coordinates to change the values. Conceivably, a student could have templates created before an exam and access them to solve a problem. I think this is extremely unlikely, but the aforementioned press-to-test feature can be set to block the student from browsing his or her documents. The computer version of this construction and the steps are shown below. Note that there is plenty of room for the construction in the calculator version, but generally the objects will be a little more crowded because of the diminished resolution.

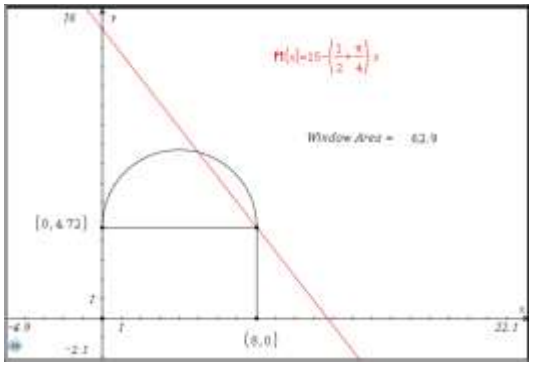


1) Resize the window.
2) Plot the points (±1,0) and (0,±1). (This was the original problem, but these points can be moved.)
3) Label the coordinates of the points.
4) Form the hypotenuses by using line segments.
5) Apply the angle measurement tool.
6) Set angle setting to degrees or convert.

The desired angle is 143º. It takes roughly the same effort to solve this problem geometrically as it does conventionally.

Maximum Area of a Norman Window

"A Norman window has the shape of a rectangle surmounted by a semicircle. A Norman window with perimeter 30 ft is to be constructed. Find the dimensions of the window that admits the greatest amount of light." [SLW]



Let x be the width of the window and y be the height of the rectangle. The perimeter is $\pi x/2 + 2y + x = 30$.

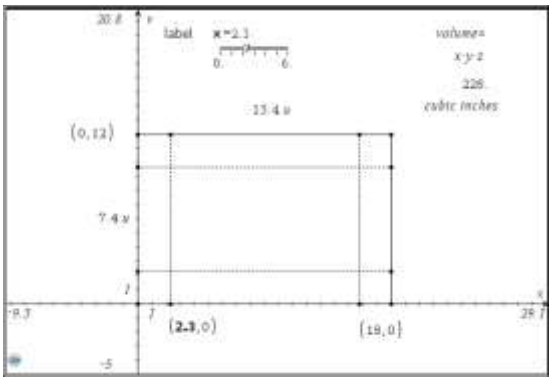
It takes more effort to solve this geometrically, but it makes a nice classroom demonstration. The rectangular part of the best window is 8 ft wide and 4.72 ft tall giving a maximal area of 62.9 ft^2.

1) Solve the perimeter equation for y and graph $y = (30 - x - \pi x/2)/2$ in a Graphs window.

2) Put a point on the x axis and display its coordinates.
3) Construct a vertical line through this point.
4) Find the intersection of the vertical line with the skew line.
5) Construct a horizontal line through the point on the skew line.
6) Make a quadrilateral to represent lower part of the window. (Although this is a rectangle, using the rectangle tool will not work here.)
7) Construct a midpoint on the top of the rectangle.
8) Construct a circle with center through the midpoint for the top of the window.
9) Put any point at the top of the circle.
10) Draw a circular arc through the top three points.
11) Measure the area of the rectangle and the circle. Divide the area of the circle by 2, and add the two areas to get the area of the window.
12) Hide the vertical and horizontal lines, intermediate areas, and the formula for total area, extra points, and the circle.
13) Grab the bottom right point and move to maximize the area.

Maximum Volume of a Box

"A rectangular piece of cardboard measuring 12 inches by 18 inches is to be made into a box with an open top by cutting equal-sized squares from each corner and folding up the sides. Let x represent the length of each such square in inches." [HLR, p. 244-5]



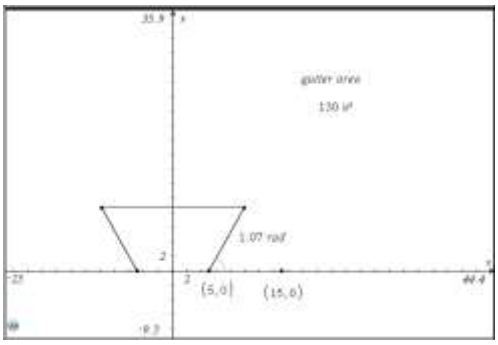
For what values of x will the volume be a maximum? What is this maximum volume?

A slider must be used because the x scale cannot be made small enough to get an accurate answer. This construction also used the compass tool. Cut out 2.3 in squares from each corner to get a maximal box volume of 228 in^3.

1) Put points at approximately (2,0), (18,0), and (0,12).
2) Find the coordinates of these points and adjust if necessary.
3) Put a vertical line through (18,0) and a horizontal line through (0,12).
4) Find the intersection of the horizontal and vertical lines.
5) Put a circle of corner (0,0) through (2,0).
6) Use the compass tool to put circles in the corners (0,12), (18,12), and (18,0).
7) Find the intersections of the circles with the lines.
8) Hide the circles and lines and the extra points.
9) Draw the box with line segments and make the inner rectangle dashed.
10) Measure the lengths of the sides of box.
11) Make and link the formula for the volume.
12) Create a slider using the variable x, maximum 6, and step 0.05.

13) Link the x coordinate of (2,0) with x and move the slider to maximize the volume.

Maximize the Rain Gutter



"A rain gutter is to be constructed from a metal sheet of width 30 cm by bending up one-third of the sheet on each side through an angle of θ. How should θ be chosen so that the gutter will carry the maximum amount of water?" [S, p. 266-7]

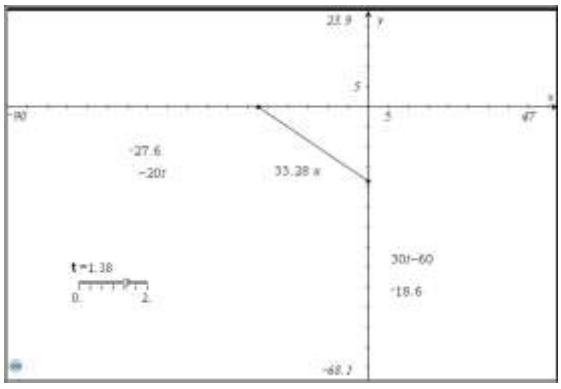
The answer is to bend the sheet 1.07 r to get a maximal cross-sectional area of 130 cm^2.

1) Plot the points at approximately (5,0) and (15,0).
2) Find the coordinates of the points and adjust.
3) Construct a circle centered at (5,0) with radius 10.
4) Make the right side with a line segment.
5) Hide the circle.
6) Reflect the segment across the y-axis.
7) Use the polygon tool to make the parallelogram.
8) Measure the desired angle and the area of the parallelogram.
9) Move the right point until the area is maximized.

Minimum Distance between Ships

"At noon, the cruise ship Celebration is 60 miles due south of the cruise ship Inspiration and is sailing north at a rate of 30 mph. If the Inspiration is sailing west at a rate of 20 mph, find the time at which the distance d between the ships is a minimum. What is the distance to the nearest hundredth of a mile?" [HLR, p. 310]

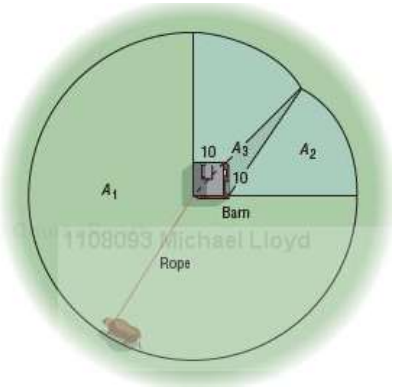
This figure used the measurement transfer tool, and gives an answer of t = 1.38 h and distance of 33.28 mi.



1) Insert a slider with variable t and set the step to 0.01.
2) Create texts for the locations of the Inspiration and Celebration in terms of t.
3) Calculate the positions of the ships.
4) Use the measurement transfer tool to plots the ships positions.
5) Connect the ships with a line segment.
6) Measure the distance between the ships.
7) Move the slider to minimize the distance.

The Cow Problem

The dreaded "Cow Problem" is rarely solved by a student correctly in my online trigonometry class because of the large number of steps required to work out the angles and apply the Law of Sines.

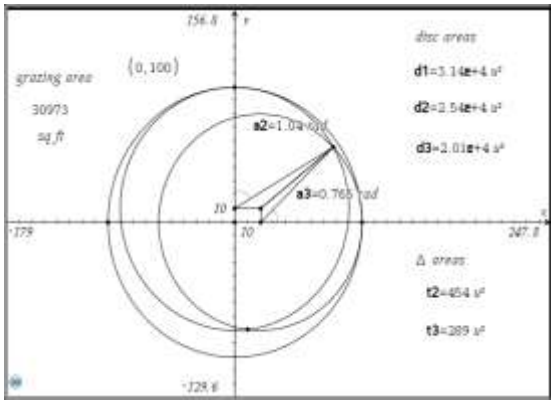


"A Cow is tethered to one corner of a square barn, 10 feet by 10 feet, with a rope 100 feet long. What is the maximum grazing area for the cow?" This problem actually originated with an old farmer in Virginia.

What if the barn in the previous problem was 10 ft by 20 ft? [SS, p. 544-5]

The following steps solve the second problem, which can be easily manipulated to solve the first.

1) Create a graphing application.
2) Resize axes to accommodate a circle with radius 100.
3) Put 3 points on axes with the approximate locations: (0,10), (0,100), (20,10).
4) Add the coordinates to the points and adjust if necessary.
5) Construct two sides of the barn using lines parallel to the axes.
6) Draw a circle centered at the origin through (0,100)



7) Plot the intersection of the circle and the x-axis.
8) Plot the intersection of the constructed vertical and horizontal lines.
9) Draw circles centered at (0,10) and touching (0,100); centered at (20,0) and touching (100,0).
10) Plot the intersections of the last two circles.
11) Hide the horizontal and vertical lines.
12) Measure the areas of the discs, triangles, and two central angles.
13) Link the areas and angles to variables.
14) Evaluate the formula in either the graph or a calculator application.

$\frac{3}{4}$ d1+$\frac{a2}{2\cdot\pi}$ d2+$\frac{a3}{2\cdot\pi}$ d3+t2+t3 ▸ 30972.8

This is the grazing area in square feet. I told my students they could see if their answers were reasonable by comparing their answers to the area of the largest disc:

d1 ▸ 31415.9

References

[HLR] A Graphical Approach to College Algebra, 5th Edition by Hornsby, Lial, and Rockswold ©2011 by Pearson
[P] Praxis study guide
[SLW] Precalculus, 5th Edition by Stewart, Redlin, Watson
[SS] Precalculus: Enhanced with Graphing Utilities, 5th Edition by Sullivan and Sullivan ©2009 by Pearson
[S] Single Variable Calculus by James Stewart ©2008 Brookscole
[T] http://education.ti.com/educationportal/sites/US/homePage/index.html

Biographical Sketch

Michael Lloyd received his B.S in Chemical Engineering in 1984 and accepted a position at Henderson State University in 1993 shortly after earning his Ph.D. in Mathematics from Kansas State University. He has presented papers at meetings of the Academy of Economics and Finance, the American Mathematical Society, the Arkansas Conference on Teaching, the Mathematical Association of America, and the Southwest Arkansas Council of Teachers of Mathematics. He has also been an AP statistics consultant since 2002.

Tales from the Crypt (or "Adventures and Misadventures while Looking for Baseball Player Graves")

Fred Worth, Ph.D.
Professor of Mathematics

Abstract - As part of my baseball related research, I visit and document burial sites of major league baseball players. This paper gives some interesting (I hope) stories from that hunting.

"All in the Family"

Ed Bailey

In 2010, I was preparing to take a trip through Tennessee and Kentucky. Ed Bailey was listed by all sources as being in the Tennessee Veterans Cemetery in Knoxville, Tennessee. Well, every source except the cemetery. Bailey's obituary indicated that his son, Joe, was a member of the city council of Knoxville. From the city's web site, I found an email address and contacted Joe. He is a busy man so a second email was required to get a response. The end of the story is that Bailey is buried at Tennessee Veterans Cemetery in Knoxville, Tennessee. But the burial only occurred the day before my arrival at the cemetery. Apparently Ed Bailey had indicated a preference for cremation with a subsequent scattering of his ashes somewhere. The family's original plans were to bury him in the veteran's cemetery but they then considered those wishes, delaying the burial. A while later they found the scattering would have been