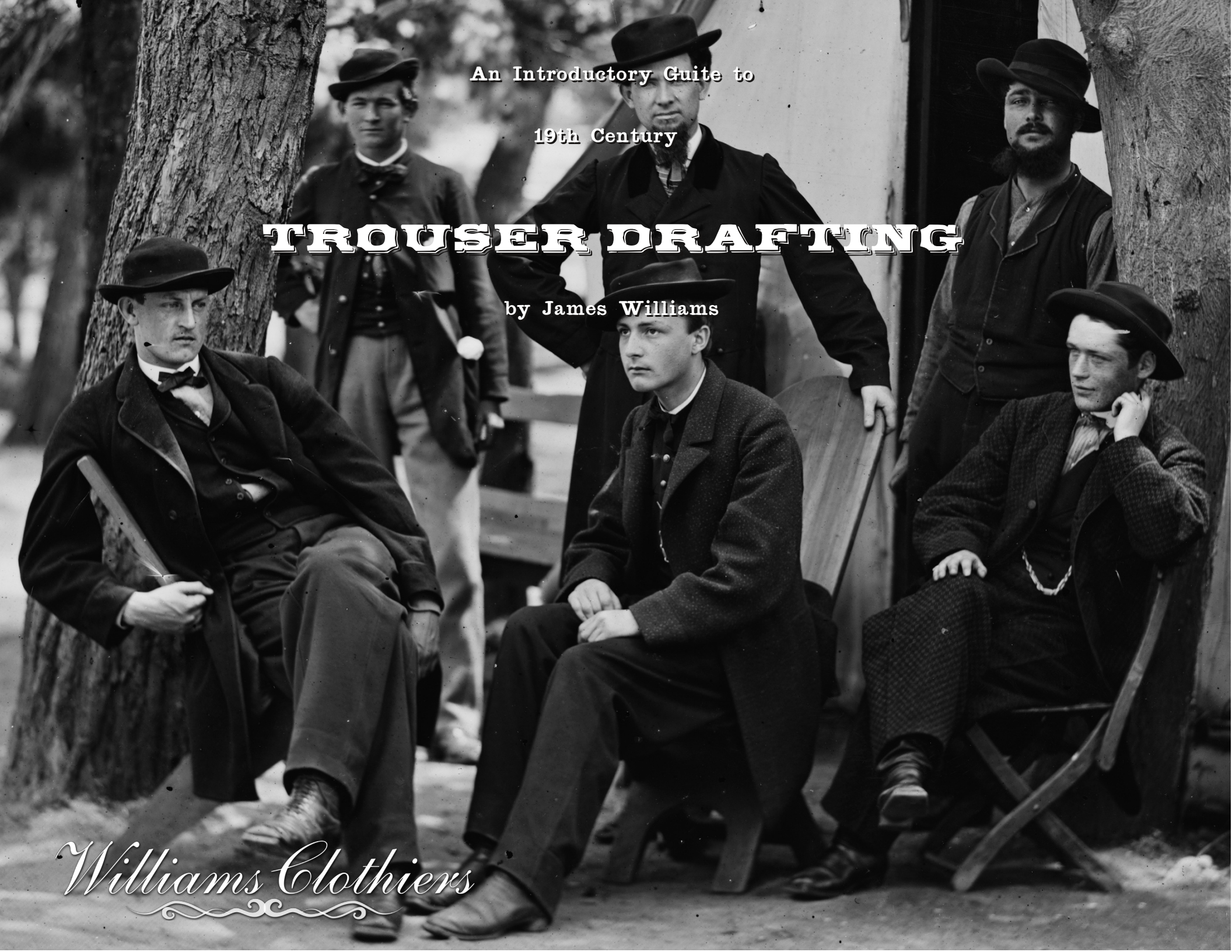
An Introductory Guite to

19th Century

TROUSER DRAFTING

by James Williams



Williams Clothiers

Introduction

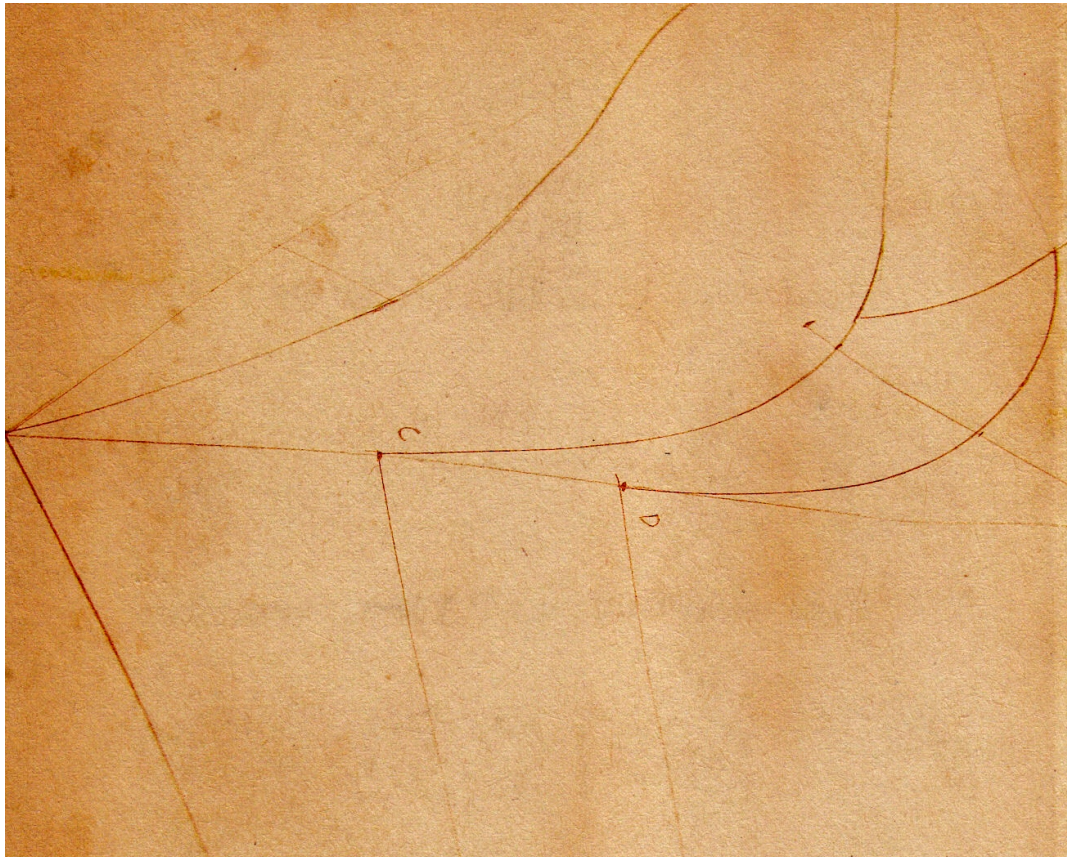
Have you been satisfied with the fit of commercial patterns? Maybe they are close, yet something – the inseam, the seat, the waistband – is not quite right. Most patterns are either drafted from modern style blocks, and altered to look period, or they are taken from period patterns and graded to your size.

The problem with either of these is that they are either made to somewhat fit a wide variety of people, or where made to fit one individual, and the pattern was adjusted for other sizes. You are not like everyone else. Each human body has a unique shape and proportion.

The solution to this problem of ill-fitting trousers is to learn how to draft your own. And in this guide, I will explain step-by-step how to do just that, based on a trouser draft from The Handbook of Practical Cutting, by Louis Devere, 1866. This is a great drafting manual, but can be difficult to grasp. Hopefully this short guide will give you some confidence and knowledge to continue drafting.

We will be learning how to draft what is called a Plain Cut trouser. These are not quite as fitted in the legs, leaving you with a style appropriate for the 1860s. If you get through this draft, the other's in his book will be that much easier for you.

Also included with this book are a set of Graduated Rulers. You should print out the sizes you need on a large format printer, such as at Staples or other print shops. I'll teach you how to use the rulers throughout the course of this book. And for your convenience, there is also a measurement and drafting spreadsheet, for aiding those who don't wish to use the graduated rulers.



You will also find a draft for basic pockets, waistband, fly, and rear buckle. These are rarely included in drafting manuals, and are one of the things that one must learn from experience, and through examining original garments.

Supplies

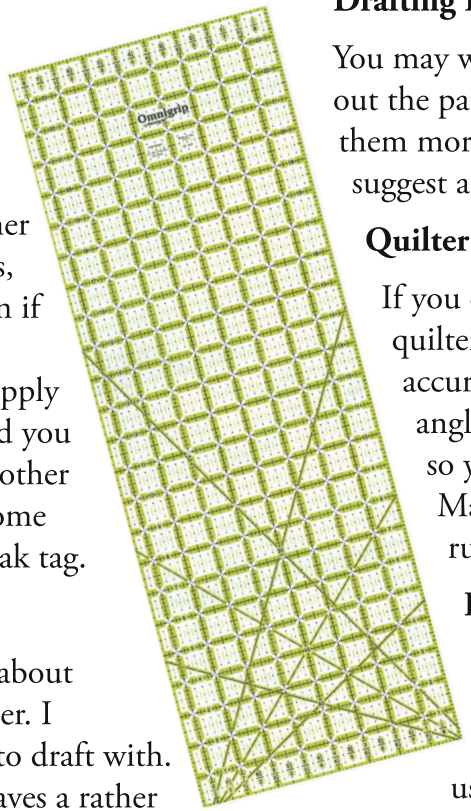
The following is a list and descriptions of all the trimmings and supplies you will need. While not all are necessary, they do make things a lot easier. The best way to go about acquiring them is to purchase one item at a time.Drafting Supplies

Several tools are needed in order to complete a trouser draft. If

you are just starting out, a quilter's ruler, hip curve, paper and pencil will do. Here is a quick list of all the supplies you will need. In the included list of supplies, you will find a list of suppliers to purchase from.

Paper

Professional tailors use oak tag to draft their patterns on. This paper is very sturdy, and not move when you go to trace your patterns on the cloth. However, it can be expensive for the beginner to buy by the roll. Some suppliers sell it in lengths, however, which you may find to be a better option if you are not going to make many drafts. Another option is to use Art Paper, found at most office supply stores. This is a bit cheaper and much flimsier, and you can find rolls from 30 feet up to 1000 feet. Yet another option is contractor paper, found at stores like Home Depot and Lowes. Here is a good source for the oak tag.



Pencils

You may be wondering what can possibly be said about pencils. There are actually several things to consider. I personally find a regular #2 pencil to be too soft to draft with. Besides having to resharpen every 5 minutes, it leaves a rather thick line, which is not so great for drafting when absolute precision is required. Try using a 2H pencil for drafting. Being a much harder lead, it leaves a fine, delicate line. It will stay sharp a lot longer, as well.

While mechanical drafting pencils may seem like a good idea, the lead supplied with them is usually HB, and you'll quickly grow frustrated with the lead breaking. Simple is best in this case, so stick with a regular pencil.

As to sharpening, a wall-mounted sharpener is nice, except for the drawback of having to get up and walk over to it. I find a nice metal portable sharpener located on my drafting table works best.

Drafting Pen

You may want to trace over the pencil markings after you've cut out the pattern in order to make them easier to see, and make them more permanent, since pencil can fade over time. I would suggest a .5mm drafting pen or smaller.

Quilter's Ruler

If you can only afford one ruler, I would suggest a 6” x 24” quilter's ruler. These rulers are see through, and allow you to accurately square up lines, as well as 30, 45, and 60 degree angles. The one drawback is that they're usually very thick, so you have to be careful when drawing lines with them. Make sure the pencil tip is flush with the bottom of the ruler.

Hip Curve

While Devere states that “with a little practice the student will be able to draw the curves accurately, without any other guide than the eye”, I have found using a hip curve to be very helpful. This is a curved ruler used to lay out the curvature of the hips. It's also useful in other areas such as the front of a waistcoat or frock. If you are feeling artistic, it is possible to free hand these like Devere suggests, but it's very useful in getting an accurate line with the least possible chance for error. Hip Curves can all be found at Fairgate.

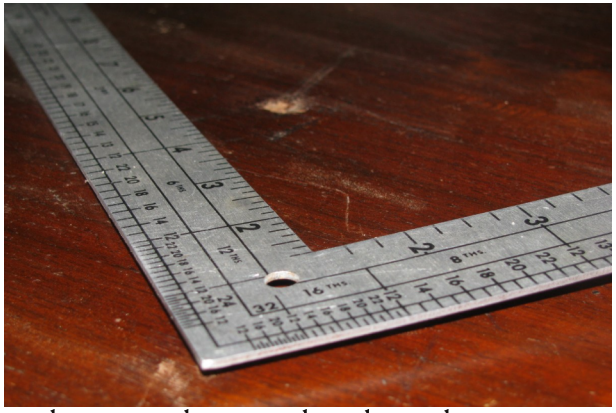
Tailor's Square

The Tailor's Square is the ruler of choice for tailors. On one side, you will find the normal inch measurements. However, turn it over and you will find a set of numbers, that at first glance seem very

confusing. In reality they are extremely helpful, allowing you to find thirds, sixths, and twelfths of a measurement on one arm, and eights, fourths, and halves on the other.

Half Scale Tailor's Square

This is simply a tailor's square, but shrunk down to half the normal size. Used the same way, it allows you to practice drafting on smaller sheets of paper. It's a good idea to practice any unfamiliar drafts at half scale, to figure out any difficulties you may encounter.*



French Curves

These curves usually come in sets of three, and are templates used to draw almost anycur ve you would ever need. I find these useful for drawing out the curves in the trouser fork, as well as armscyes, neck lines, and more. They're very inexpensive, so you should definitely have a set.

Flexible Ruler

These are a more modern innovation. I like them because you can visualize the curve before you draw it. They're also very helpful for measuring the length of a curved seam.

Measuring Tape

Used for measuring, these usually are made of plastic or fiberglass these days. While it may be possible to find a cotton one, they are liable to stretch out of shape over time.

Paper Scissors

You definitely do not want to use your good shears while cutting out paper patterns. That is a quick way to dull and ruin the blades. Instead, use an old pair, or buy a cheap pair of scissors just for paper.

Eraser

Just in case you make any mistakes. I find both a rectangular rubber eraser and a kneaded eraser to be useful at times.

Seam Gauge

This little ruler allows you to mark out a precise seam allowance. Also good for marking pockets, buttonhole spacing, and more

Pattern Tracer

The wheel on this tool will help you to transfer patterns easily.

Measurements

You may be used to picking out your new pair of pants using just two measurements – your waist and inseam. Sadly, today's ready made clothing does not usually fit as it should.

In the 19th century, and in fine bespoke tailoring to this day, several other measurements are used as well. You will see how they combine to make you a perfectly fitted pair of trousers. Do not try to take your own measurements. Instead, find an experienced tailor or seamstress to take accurate measurements for you.

In order to take other's measurements, you must first learn to take measurements with care and accuracy. Begin by finding out what your client's wishes are before taking any measurements. The style and cut depend upon what the trousers will be used for. Do you wish to have a tight fitting waist, or suspenders? Will you be mostly sitting or standing in the trousers, or perhaps riding? Are the trousers to be loose as in the 'peg-top' style of the 1860s, or the much more fitted look of the 1840s? Breeches or full length? As

you can see, there is a lot to consider.

After the style is determined, make sure the client is standing in a relaxed position, neither too erect nor too slouched. People are often inclined to stand stiffly, and this can interfere with the measurements and how the trousers will fit later. Try telling a polite joke, or amusing story to get the client to relax, then proceed to take the measurements.

Devere had a series of five principal measurements taken for trousers, plus three more 'supplemental' measures used for variation in fashion. Of the first five, all are still in use today except for the front measure. Take your measurements using a normal inch tape, using great care to ensure accuracy. Take each measurement deliberately, and without hurry. It can be helpful to take a measurement twice to double check your work.

Before taking the measurements, be sure that the trousers the client is wearing are at the proper height at the waist. Ideally they will be wearing period trousers of correct fit. But If they are too high or low, the measure must be taken from the level of the waist, and not from the top of trousers. The waist of a pair of trousers should pass horizontally around the body, at the level of the natural waist. A trick to remembering where the level of the waist lies, is to tie a cord around the waist. Take all measurements from that cord.

Following are the measurements and period descriptions of how to take them. Write each measurement in the space provided on the measurement chart included with this book.

Principal Series

1) Side Seam

Or length of side measured from the top to the bottom of the trousers, starting from the top of the side seam at the hollowest part of the waist, and not including the waistband. This measure should be taken tightly, and it is the leg itself, not the trousers, which is to be measured.

When taking the first three measures, it is easiest to measure to the heel of the shoe, so as to be consistent. Then make a deduction based upon how you want the trousers to break. Some like the trouser legs to reach exactly to the foot, while others like to have a break or even folds at the ankle.

2) Front Length

Measured from the top of front, not including the waistband, to the bottom of the inner leg seam. In thin waists, the measure will generally be less than the length of side seam; it will be longer for stout men on account of the protuberance of the stomach, and by the difference it presents with measure of Side, it indicates the proper degree of slope to be given to the front of the waist. To take it correctly, the leg should be a trifle advanced as shown on fig. 1, and for very stout men, the measure should be kept close to the leg of trousers, just below the fork.

3) Leg Seam

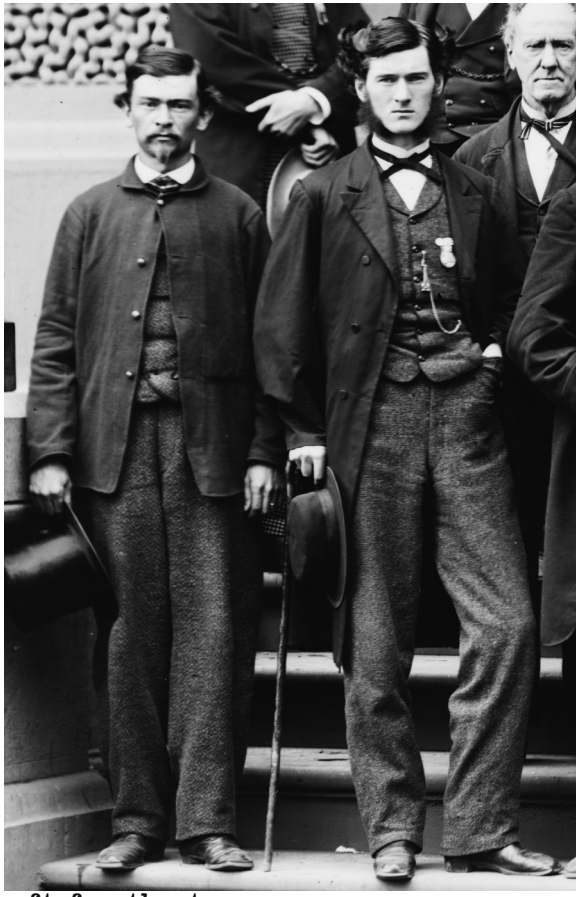
Taken in the usual way and with the greatest possible accuracy, as upon this depends the correctness of the length of the trousers. To take this measure, hold the tape close up in the fork of the trousers, letting the tape fall naturally to the foot at the bottom of leg seam. We may observe that when using the looped tape, it should not be pushed up too tight, or the leg seam measure would become too long, and the trousers would be too long in the legs.

4) Waist

Measured in the usual way, underneath the waistcoat and rather tight; it will, for these reasons, be about 1 inch less than the waist measure taken for a coat.

5) Seat or Hips

This is the size round the seat at the most prominent part, just over the hip joint. This measure often gives the same figures as the breast measure of the man, but is more frequently a little larger, and like that measure serves to indicate the graduated measure to be used when forming the draft for the trousers.



Supplementary Series.

These measurements are more for fashion than fit. I advise taking the Bottom measure, and proportioning the thigh and knee into a pleasing line according to the customers wishes.

6) Thigh

Taken as high up as possible. This measure indicates the allowances for fashion or the particular style required. In general, it is the left or dress side with is measured.

7) Knee

taken according to fashion: when it is for tight fitting trousers the knee bust be bent.

8) Bottom

Also according to fashion, or the style required.

After all measurements are taken, you need to look at the client for disproportions. Are they stooped or erect? Thin or corpulent? Measurements can only tell us so much about a person. One must develop and train the eye in order to apply this information to a draft.

Some Mathematics

One of the more difficult concepts to understand is how Devere varied the size of a pattern. He useds a size 18 3/4 breast as the basis for all of his patterns, which is equivalent to a 37 1/2 chest. This is called the proportionate model. If you are lucky enough to have a 37 1/2 chest (and the other corresponding measurements are the same), you can draft the patterns as they are straight from the book, with a normal ruler . Unfortunately, very few people fit these measurements, so adjustments have to be made.

Let us suppose we have a gentleman with a 42 inch chest, and want to find the correct balance for a coat. On a 37 1/2 inch proportionate model, the balance is 2 1/2. But a 42 inch chest would make that larger. First, you need to find the correct ratio between the 42 inch chest, and the proportionate chest. That would look like this:

42 / 37.5 = 1.12

After getting the number of 1.12, we multiply that by the balance measurement (or whatever measurement we need to get):

1.12 * 2.5 = 2.8

Then, it's a matter of converting that 2.8 decimal into inches. This comes out to somewhere between 2 3/4 and 2 7/8. As you can see, this method is not very accurate, and prone to mathematical errors. And it takes a long time when you have to do 20 or 30 measurments this way.

Luckily, Devere was a fairly smart guy. He devised a set of rulers, called Graduated Rulers. The graduated rulers are, "a series of measures, which are successively graduated larger and smaller than the common inch measure, and are used to draft patterns for larger or smaller sizes than the 18 3/4 breast." What does this mean? Instead of doing those calculations above, you simply choose a correct sized ruler and then draft the pattern as it is in the book.

Devere's Graduated Rulers

For example, you are measuring someone and they have a 48 inch chest. You would then go to your set of rulers and choose the one marked size 48 (or 24 inch breast). If you compared this to a normal inch ruler, you would see that it is a lot larger, yet it still has 12 inches to it.

Where can you get these rulers? In Devere's time, these rulers could be obtained from Devere's company, and came on paper, tapes, or on wooden rulers. Devere has long gone out of business, but luckily, the rulers are not too difficult to make yourself. I'll save you that trouble though.

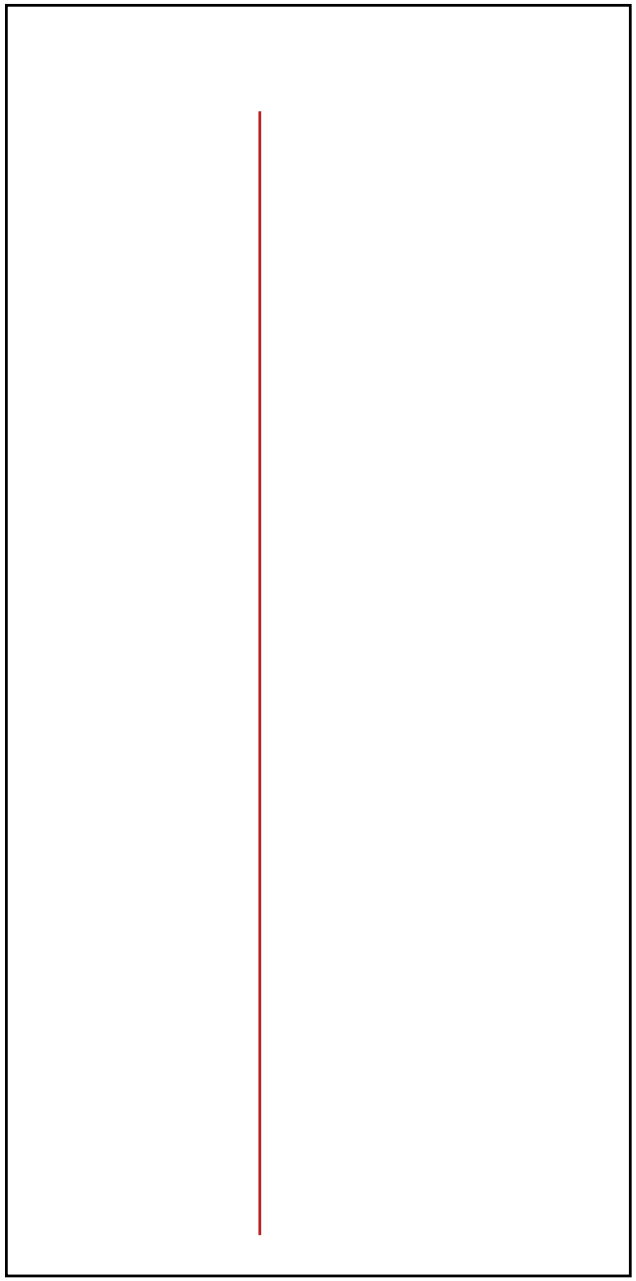
I have created a set of graduated rulers, sized 34 through 50, for your convenience. They are on 11 x 17 inch paper, so you'll need to find a print shop to print these. I was able to get mine printed for $3, on a nice heavy weight card stock, so it's not going to hurt your wallet. They are in Adobe pdf format. When printing from Adobe Acrobat, be absolutely sure to set Page Scaling to None. If

this is not done, your whole set of rulers will be off. After they are printed, I would take a normal inch ruler and compare it to the size 37 1/2 graduated ruler. They should be exactly the same. If they are off, it was printed wrong, and you need to check your settings and try again.

The Draft

It is now time to begin the draft itself. Make sure you have a large enough surface to work on, so that the whole draft may be on the table at once. Dining room tables are great for this.

Take each step slowly, being sure to follow instructions carefully. If something seems off, go back a few steps and check your measurements. Above all, don't get frustrated! If you have any questions please don't hesitate to contact me via my **website**.



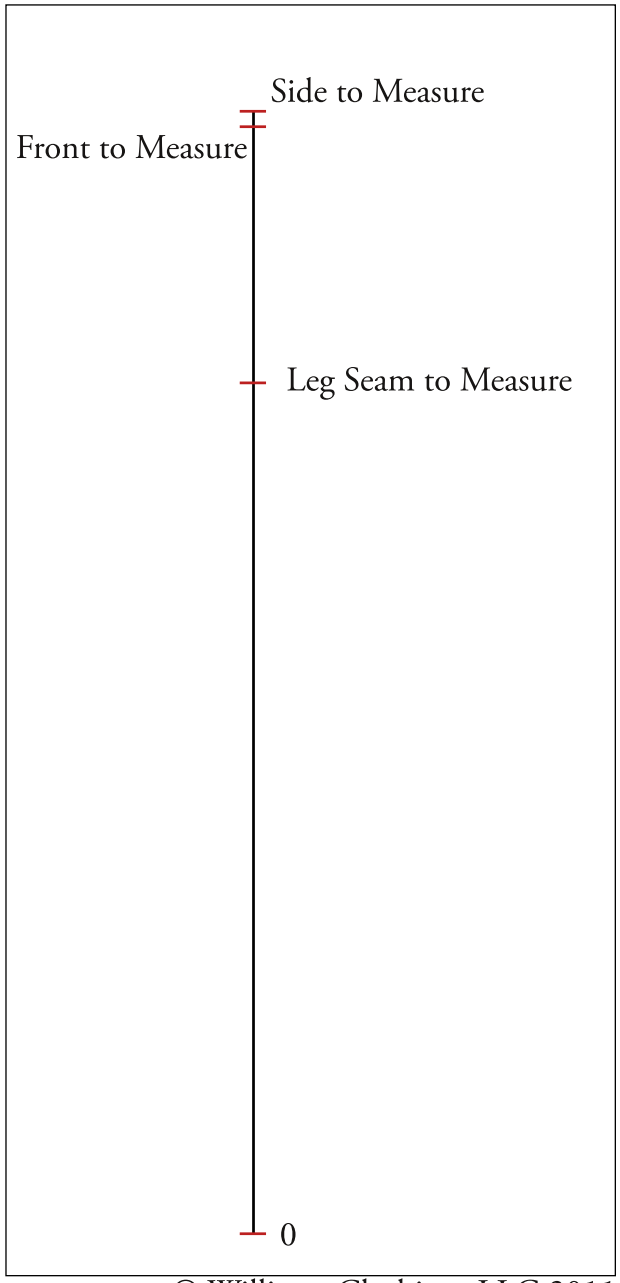
Plumb Line

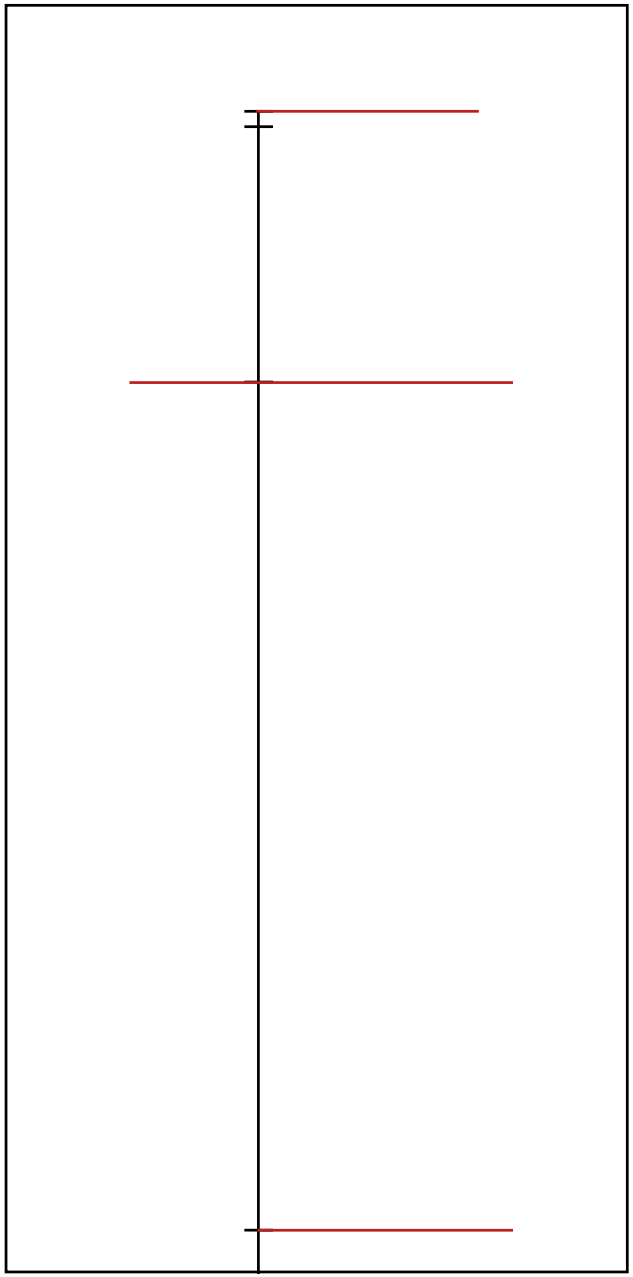
Start off by drawing a long, straight line, referred to as the plumb line. This is a very important line, as it forms the basis for the entire draft, so if it is not straight, the draft will be off. The plumb line is also used to align the pattern with the straight grain of the fabric.

Mark Vertical Points

Starting from the bottom, mark the length of the Leg Seam to measure.

Next, do the same with the Front Length and Side Seams, making a mark at all three points.





Square Across

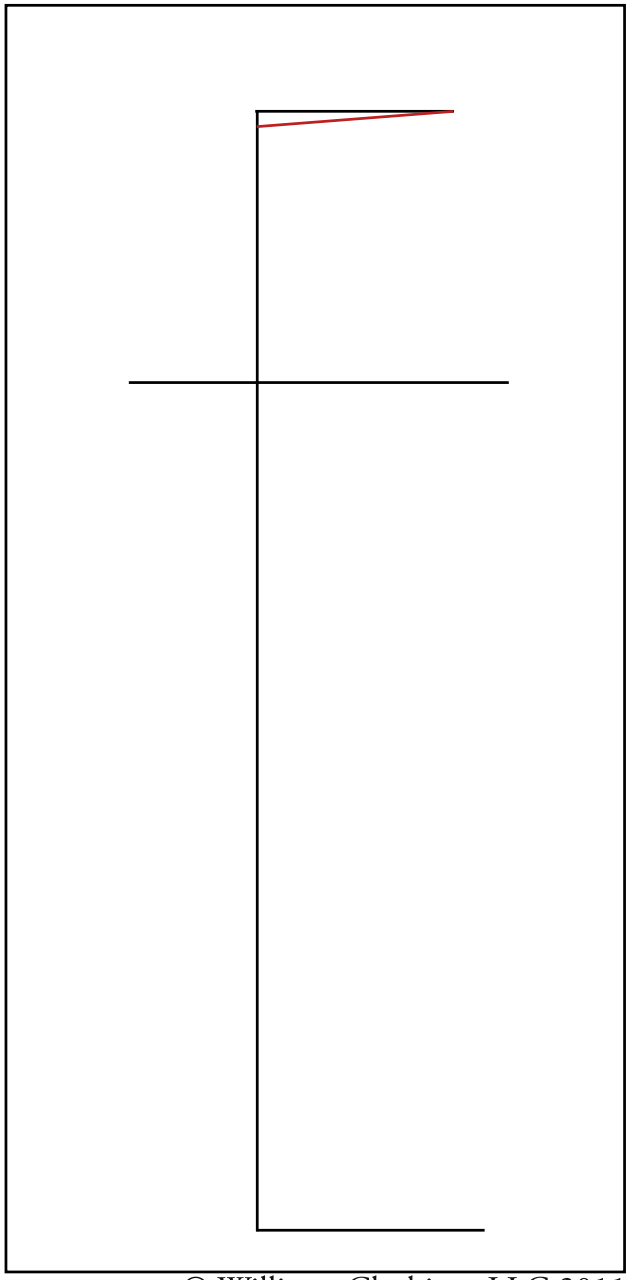
Next, take your tailor's square and draw three horizontal lines from the Side, Leg Seam, and Bottom points.

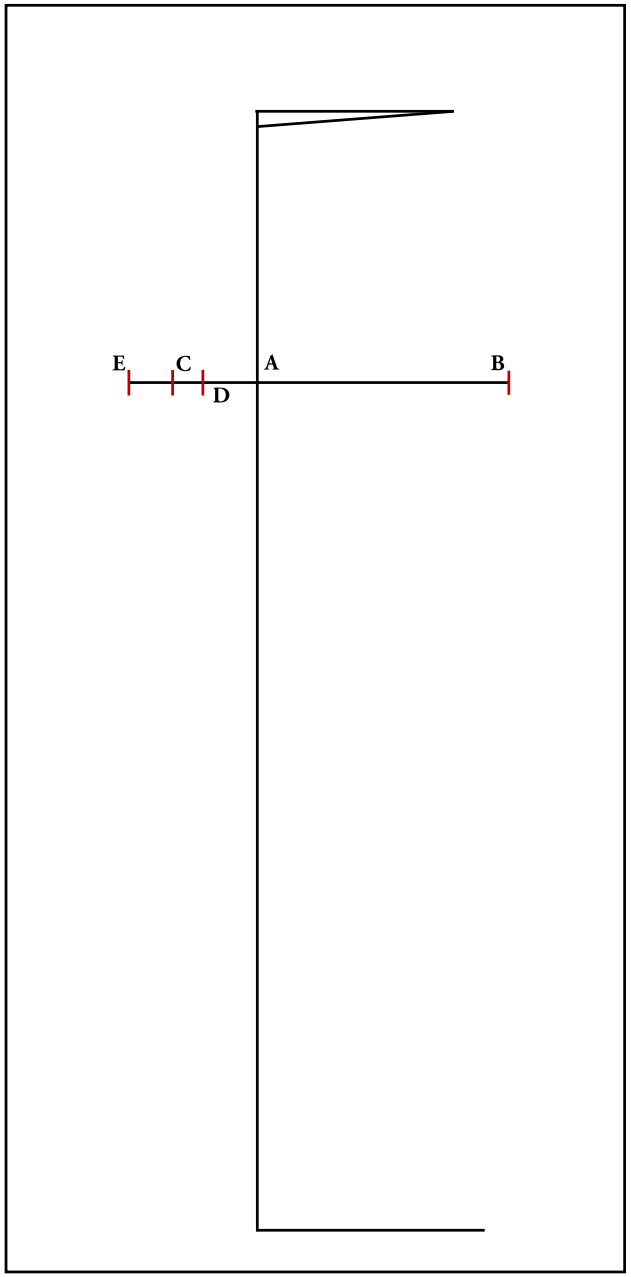
The waist line should be equal to 1/4 of your waist measurement.

Note that the line at the Leg Seam extends across the plumb line.

Waist Seam

Draw the waist seam from the top of the Front point, to the top of the side seam, as shown.





There are now two choices, use the graduated rulers, or by the common inch.

Using the graduated ruler corresponding to your seat measurement, mark out the following:

A - B 9 3/4
A - C 2
C - D 3 1/8
C - E 4 3/4

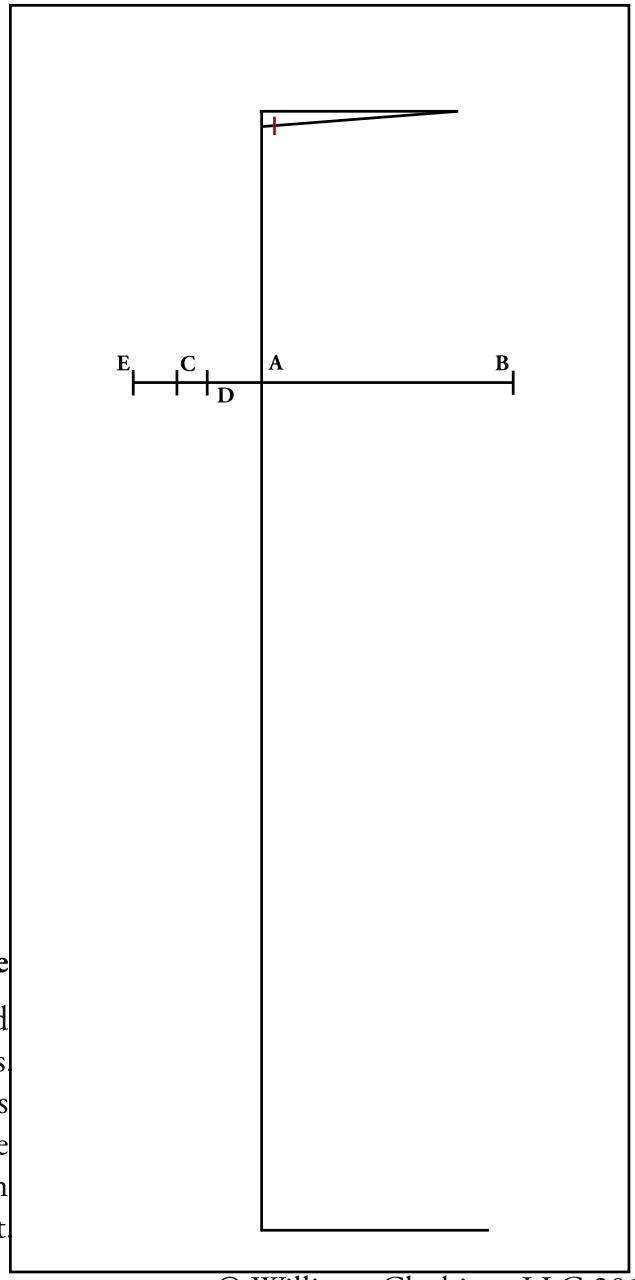
If you choose to use the common inch, it is more complicated. The calculations are:

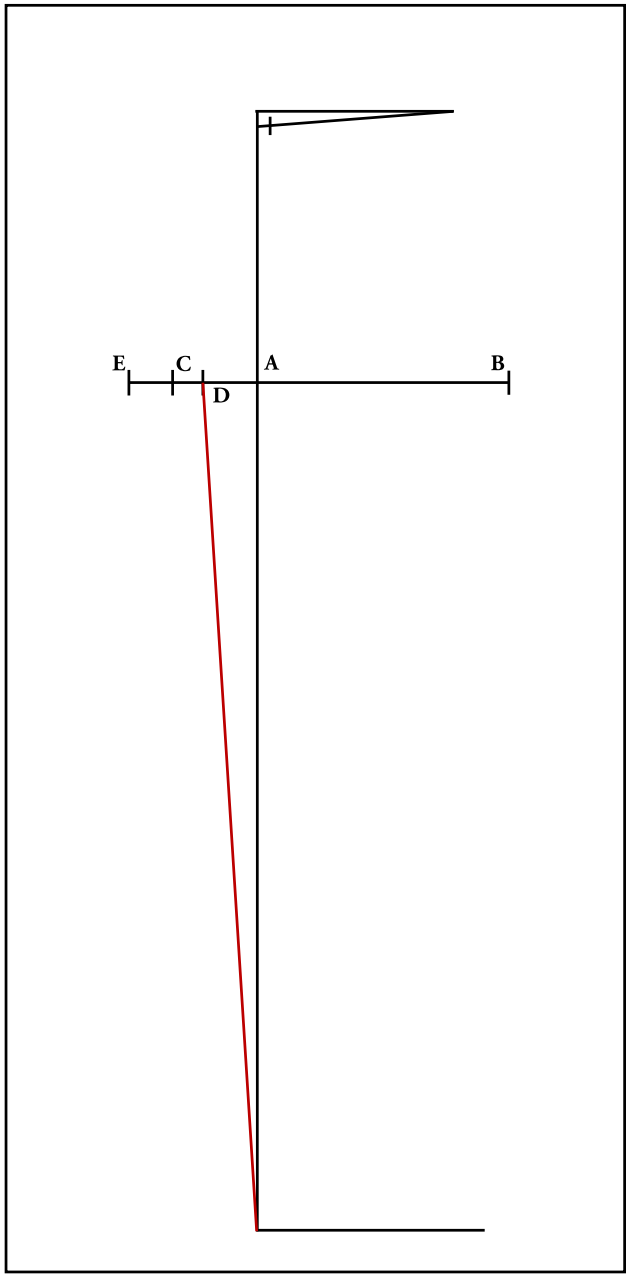
A - B One Quarter of the Hips
A - C One Third A - B
C - D 1 1/8 of an Inch
C - E Half of A - C

As you can see, using the graduated rulers is a lot easier, as there are no calculations necessary. However, if you want to use common inches, the included spreadsheet will make all the calculations for you.

Slope

On the Waist seam, measure 1/2 graduated inch from the plumb line, and mark this. This will give the angle of the seat seam, as you shall see. Be sure it is marked on the Waist seam itself, and not the construction line above it.



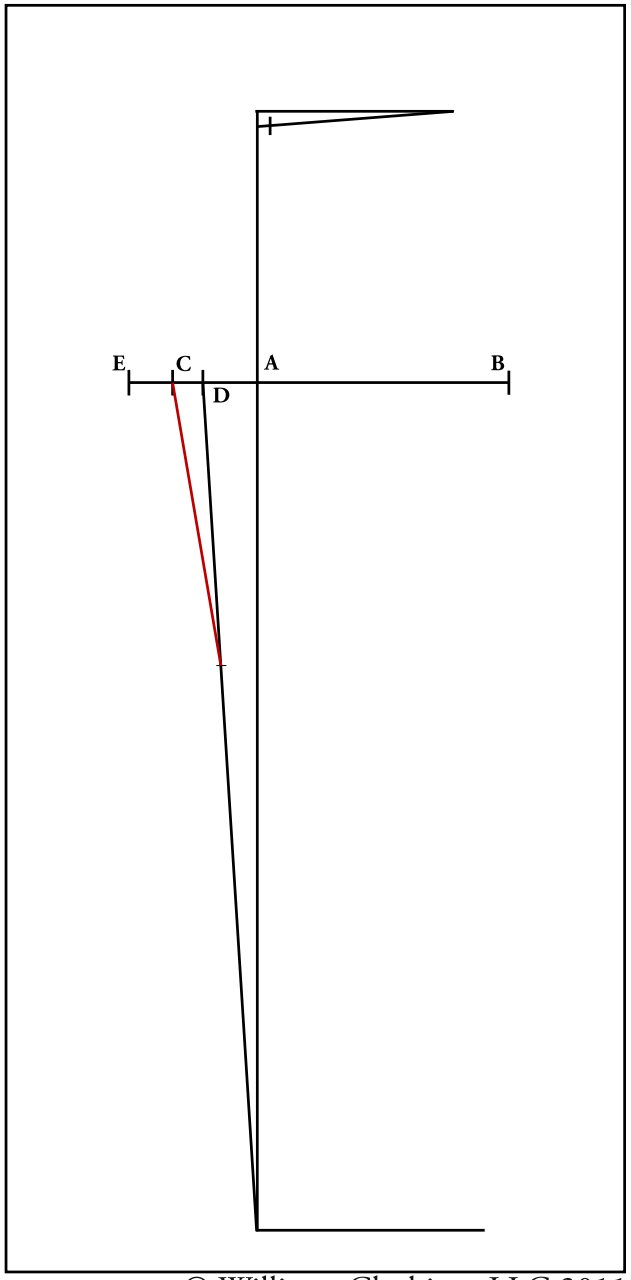


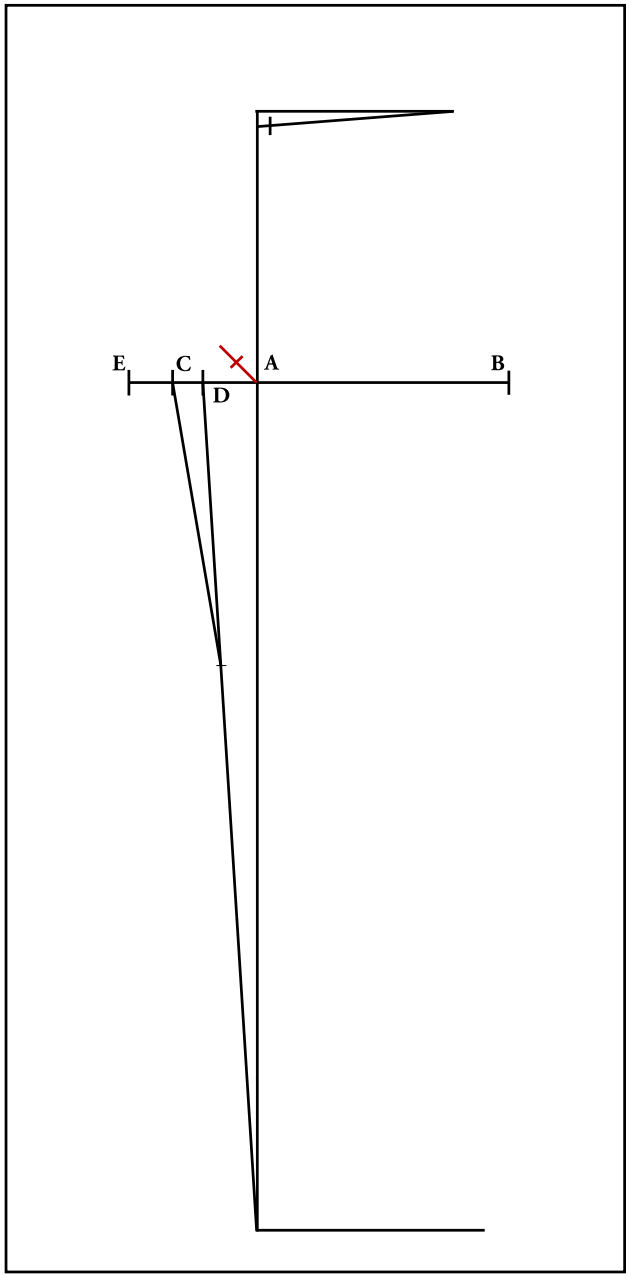
Leg Seam

The Leg seam is drawn as a straight line from point D, to the plumb line.

Left Leg Seam

For the Left or Dress side of the Leg seam, draw a straight line from C down the line from the right side, at a point about 1/3 the length of the leg seam.



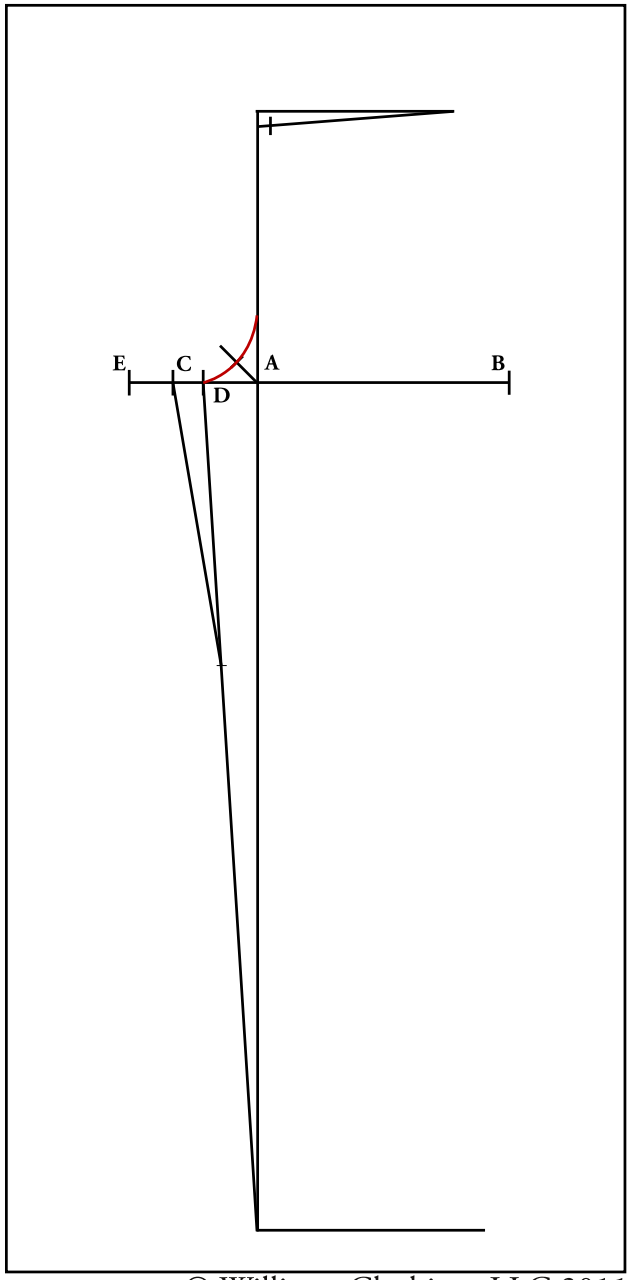


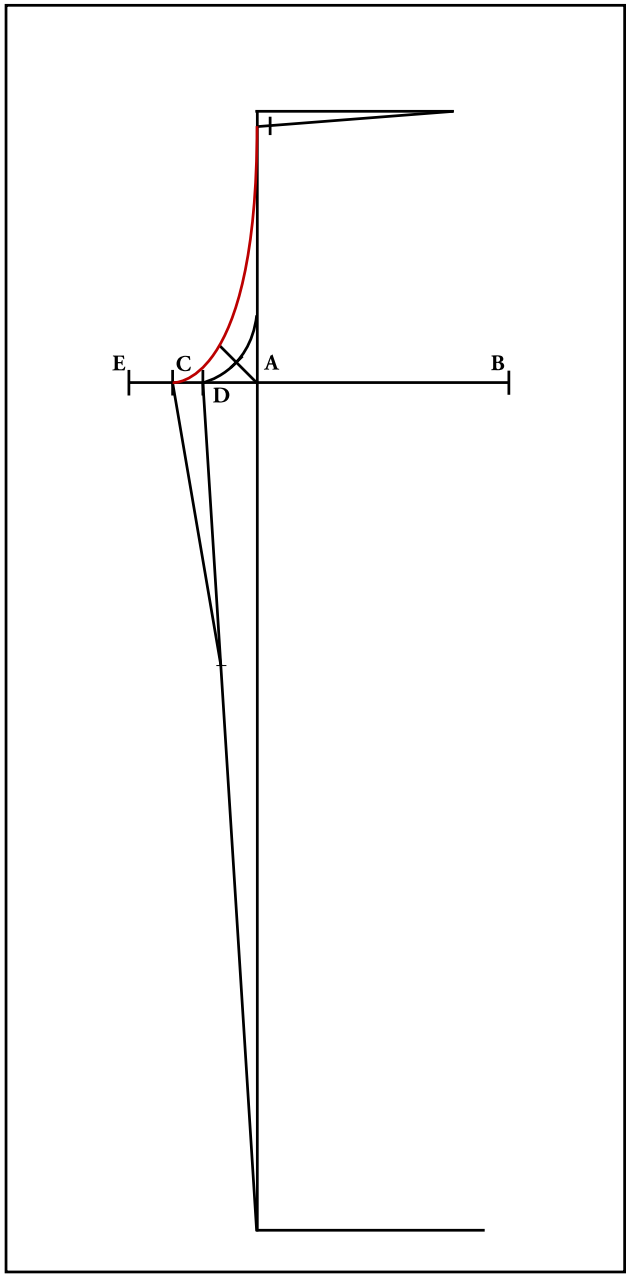
Hollow of the Fork

Measure out a line at 45 degrees from point A. This line should be two inches long, for the left or dress side, and marked at 1 inch for the curve of the right or non-dress side.

Right Crutch

Through the one inch mark you just made, draw a curve for the right side from point D, to a point on the plumb line 2 1/2 inches above point A.





Left Crutch

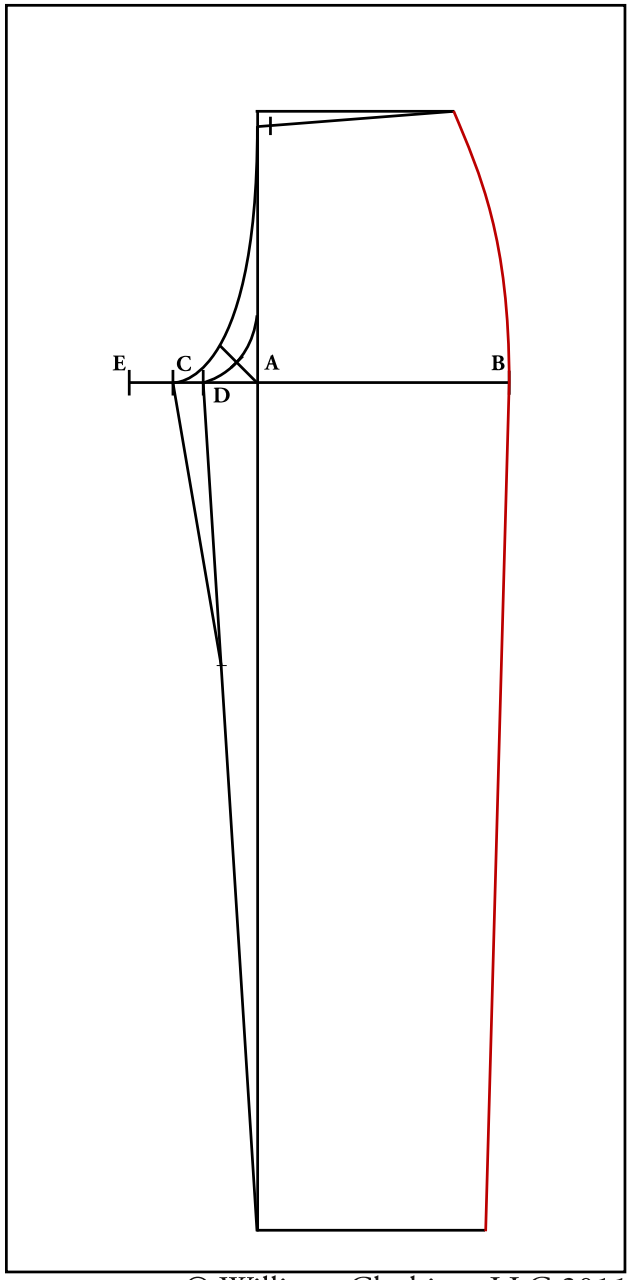
Draw the left crutch by connecting C to the 2 inch mark on that 45 degree angle, and join it at the top of the plumb line where it meets the waist.

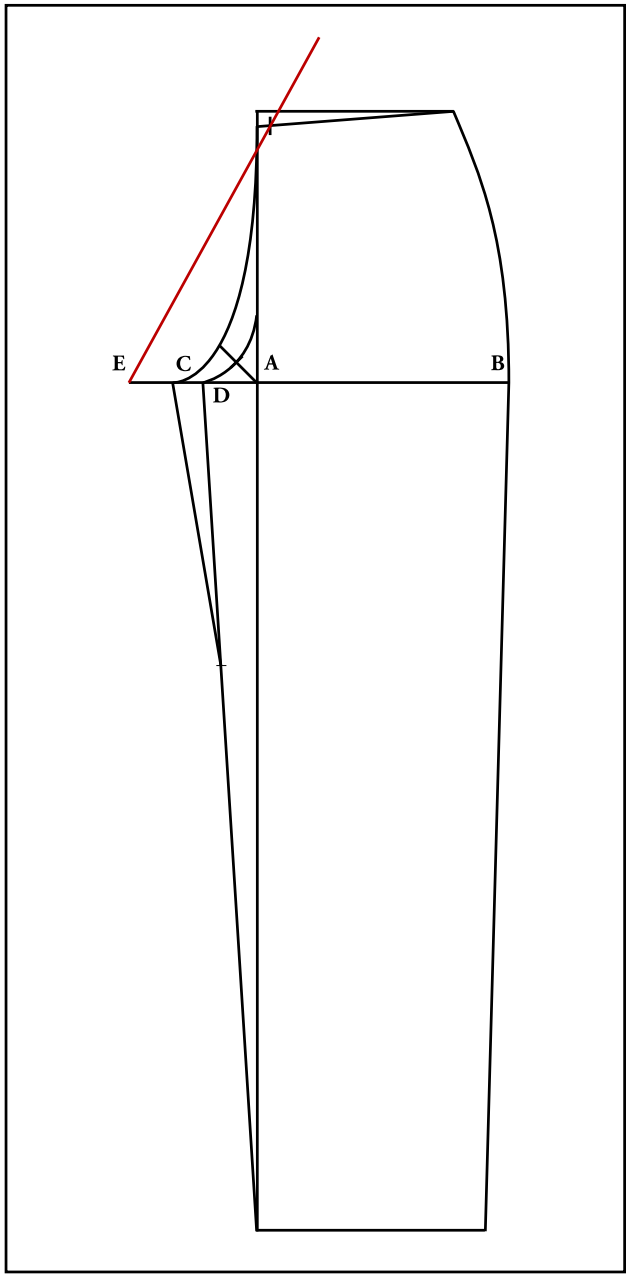
Drawing these curves is a lot easier if you use those French Curves!

Front Side Seam

The Side seam of the front is drawn in a straight line from the bottom, to point B, where it then goes on to meet the Waist in a nice graceful curve.

The Fronts are now complete.





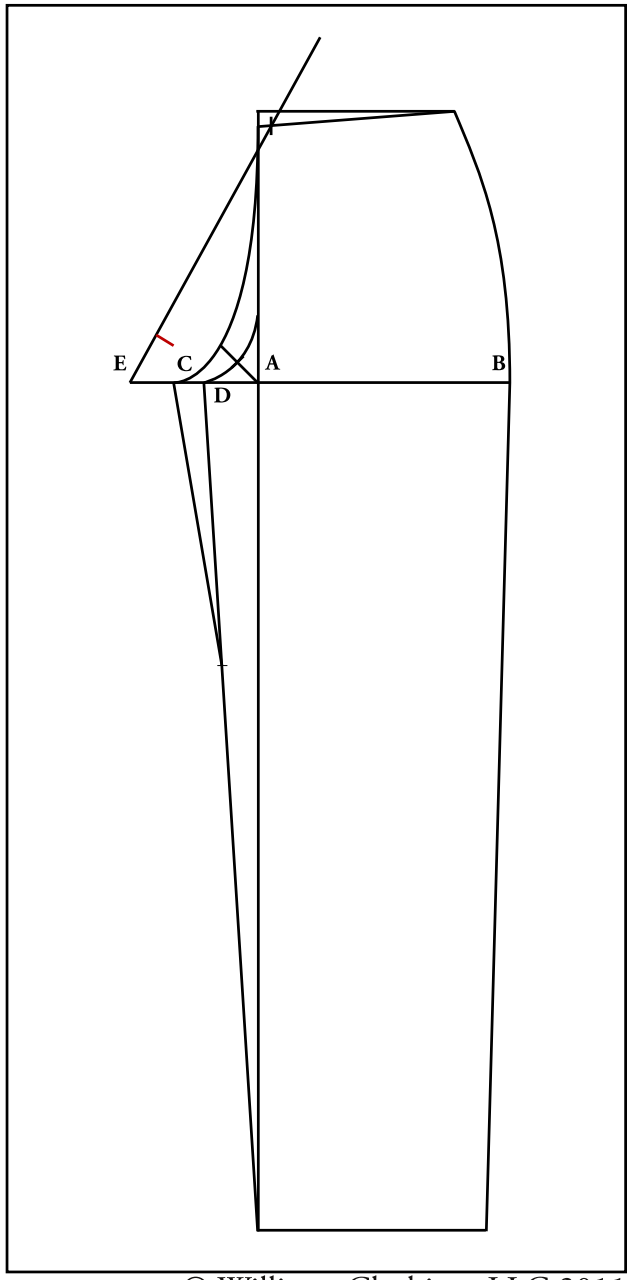
Seat Seam

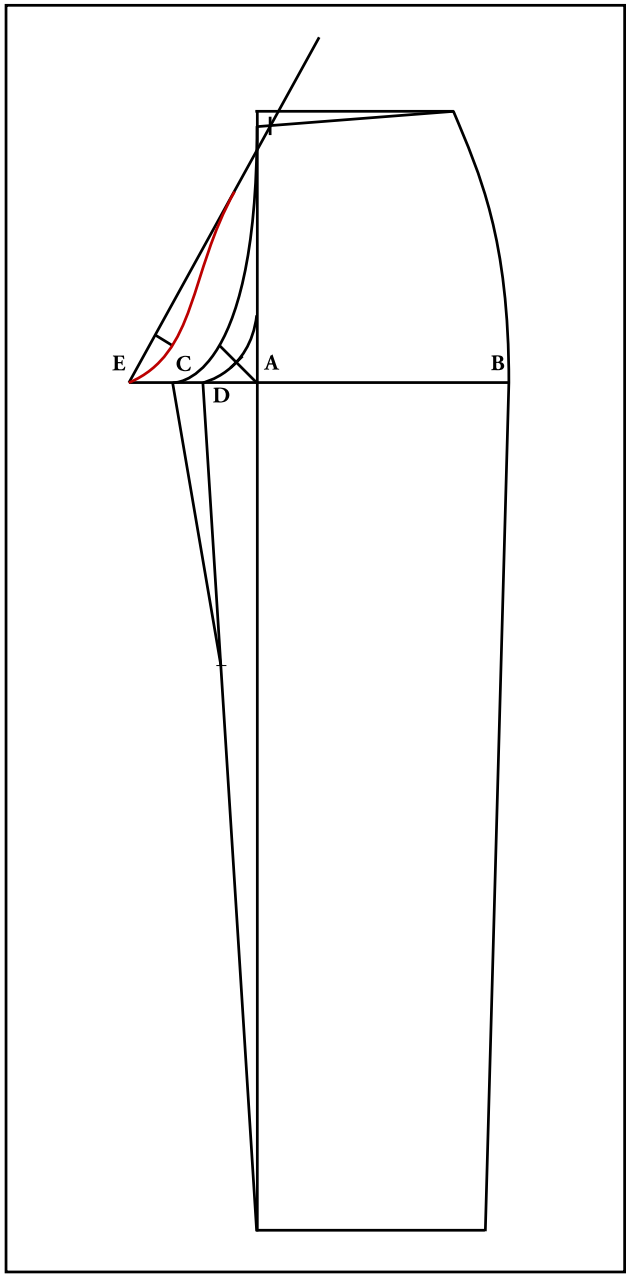
Draw a straight line from the fork at Point E, running through the waist seam at the 1/2 inch mark you made. Continue this line past the mark, one or two inches beyond the plum line.

I find it good practice to overshoot a little here, and make the line longer than you need it. That way you don't have to add on to the line, which can be prone to error.

Hollow In

At a point 2 inches from point E, measure in 3/4 of a graduated inch from the seat seam.



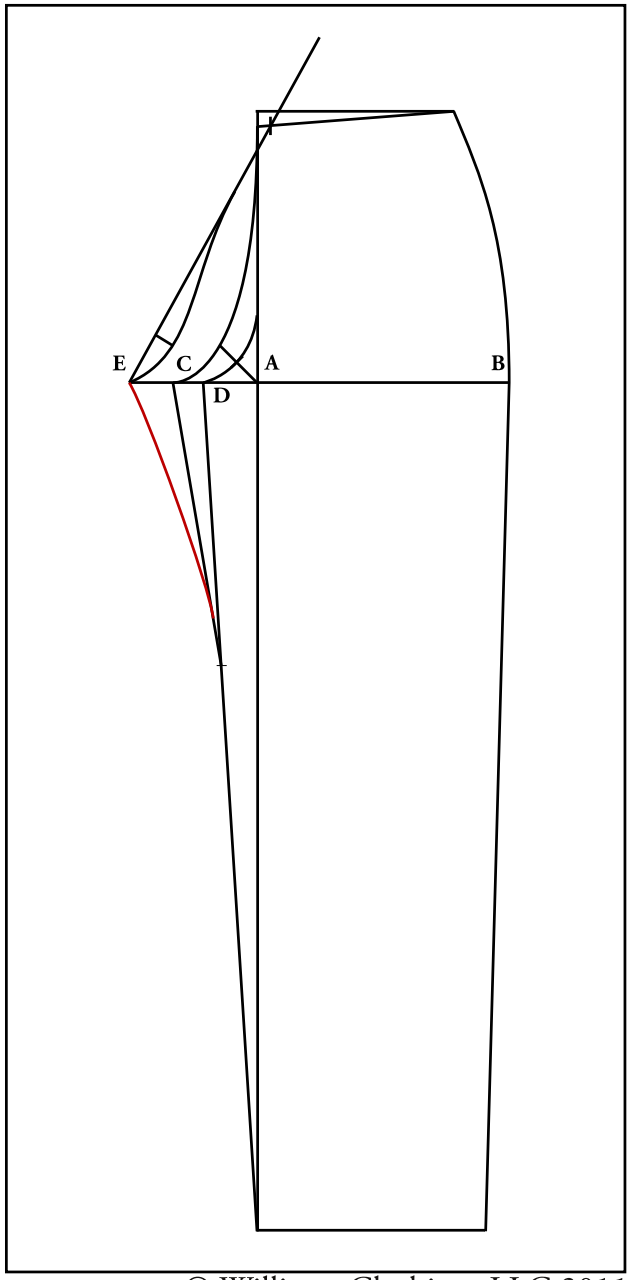


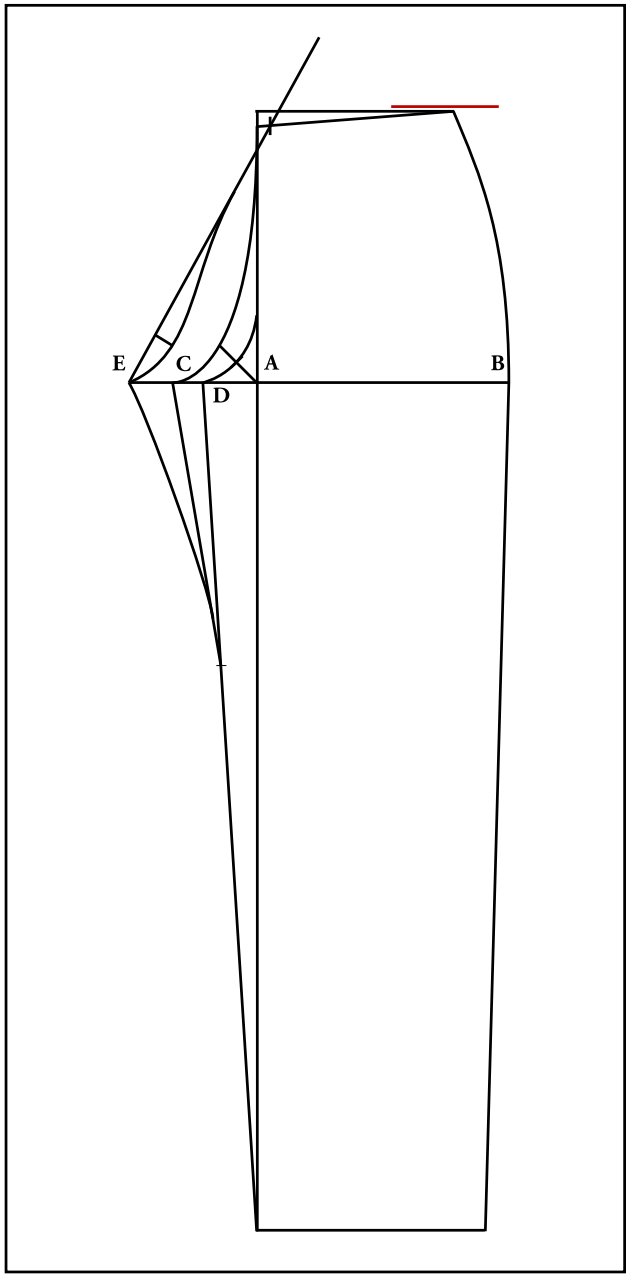
Seat Seam

Draw a curved line using your French curves, connecting point E, to the point you just made, joining in a smooth curve to the seat seam construction line.

Completing the Leg Seam

The upper part of the Leg seam of the back forms a very slight curve. Start from point E, and join the leg seam of the front, a little above the place where the dress and non-dress sides meet.

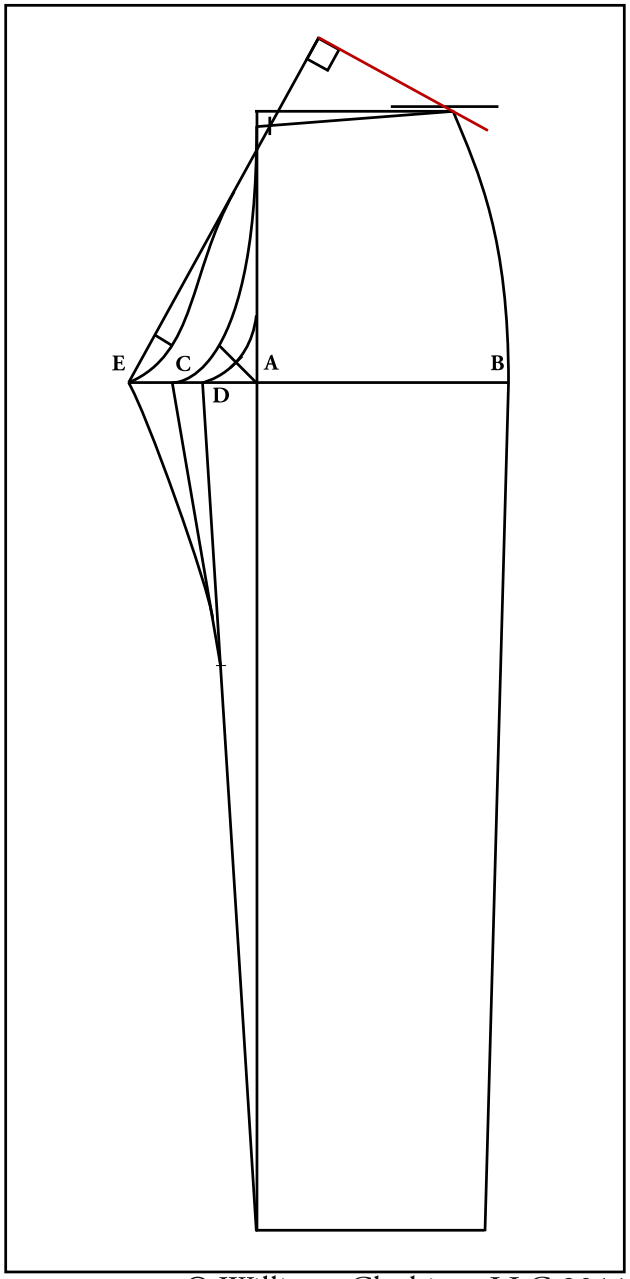


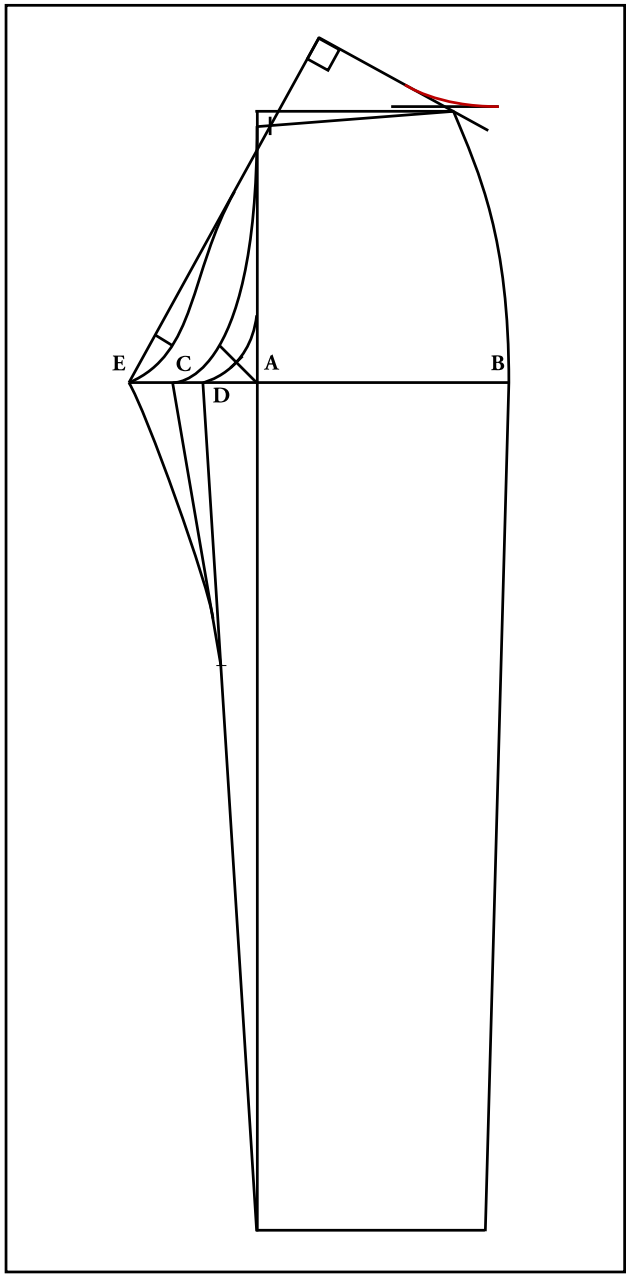


Draw a line 1/4 inch above the Side construction line. This is used to determine the correct height of the back.

Squaring up

Take your tailor's square, and place it against the seat seam. Draw a line square from the seat seam to the point where it meets the side of the waist seam.





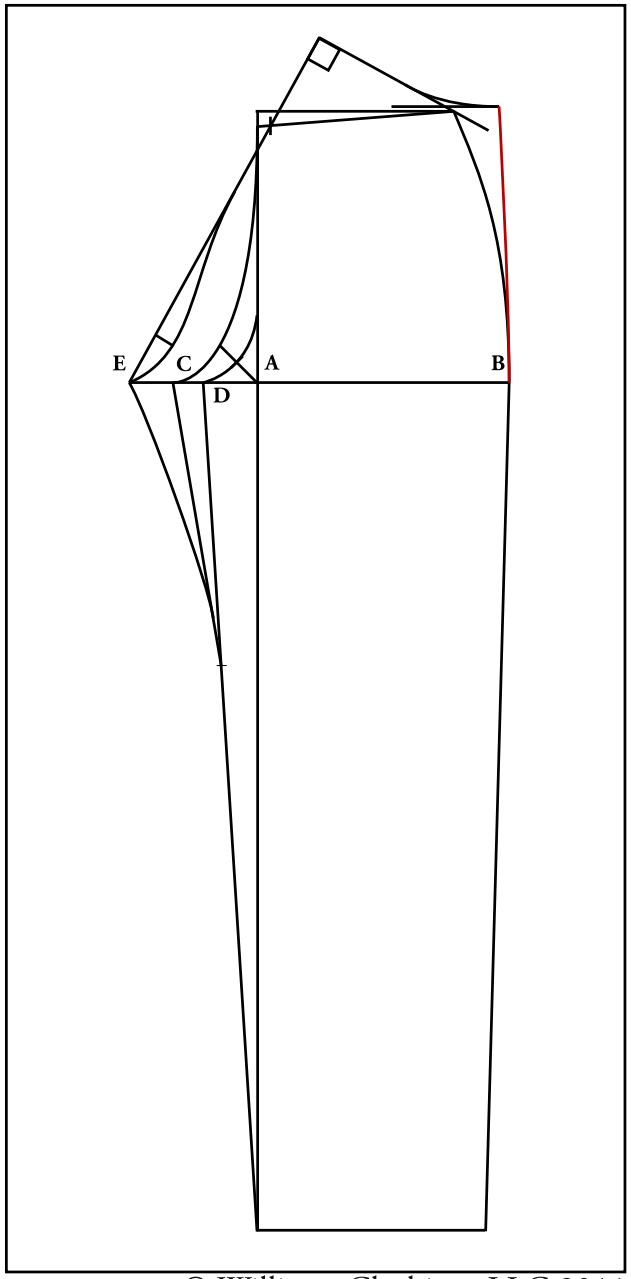
Back Waist Seam

Curve this line to a point equal to 1/4 your total waist, measuring from the Seat Seam.

Complete the Draft

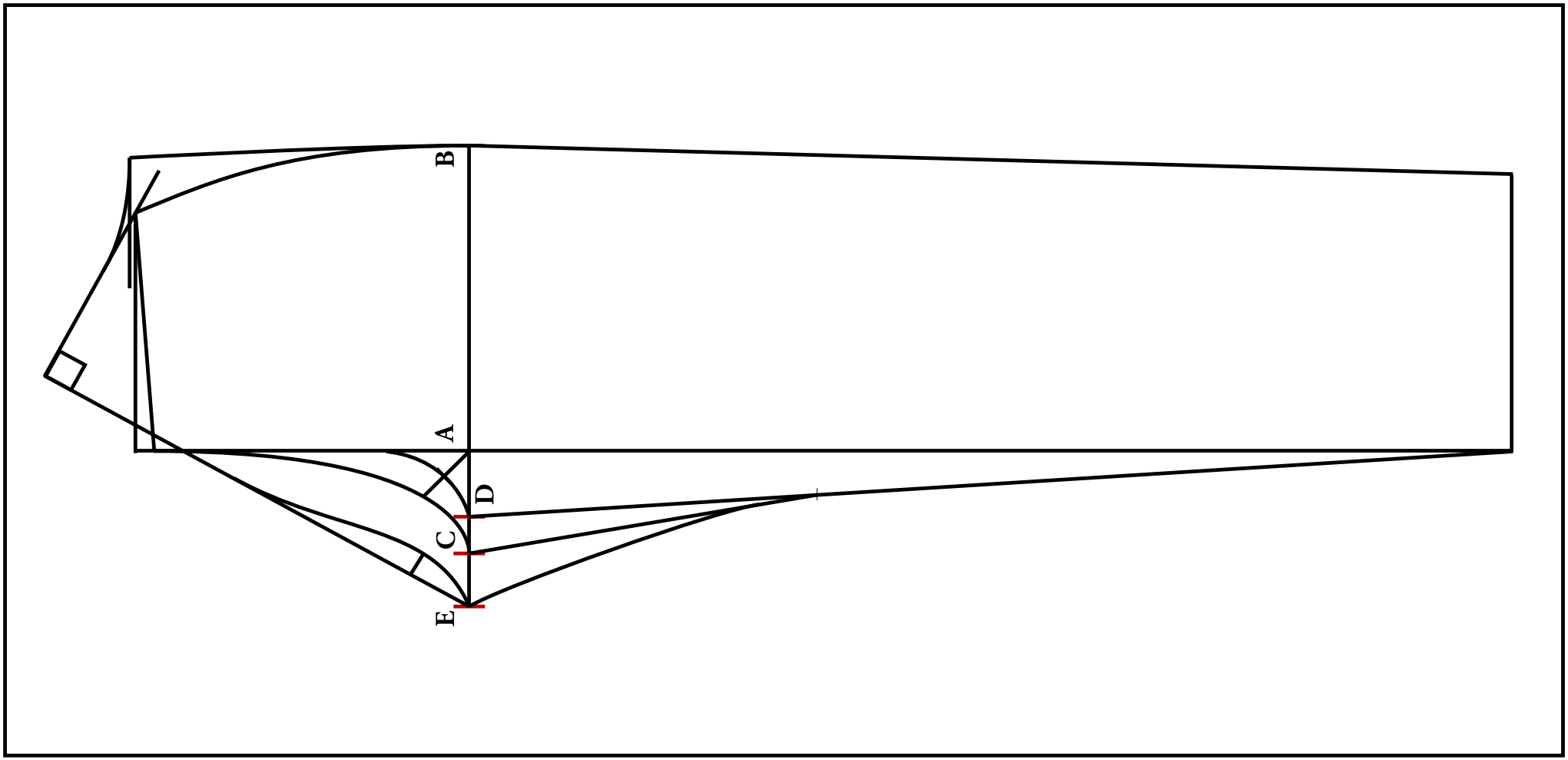
From the point you just made on the back waist seam, connect to point B in a slightly curved line, meeting the straight line down to the bottom.

Congratulations, the draft is now complete.

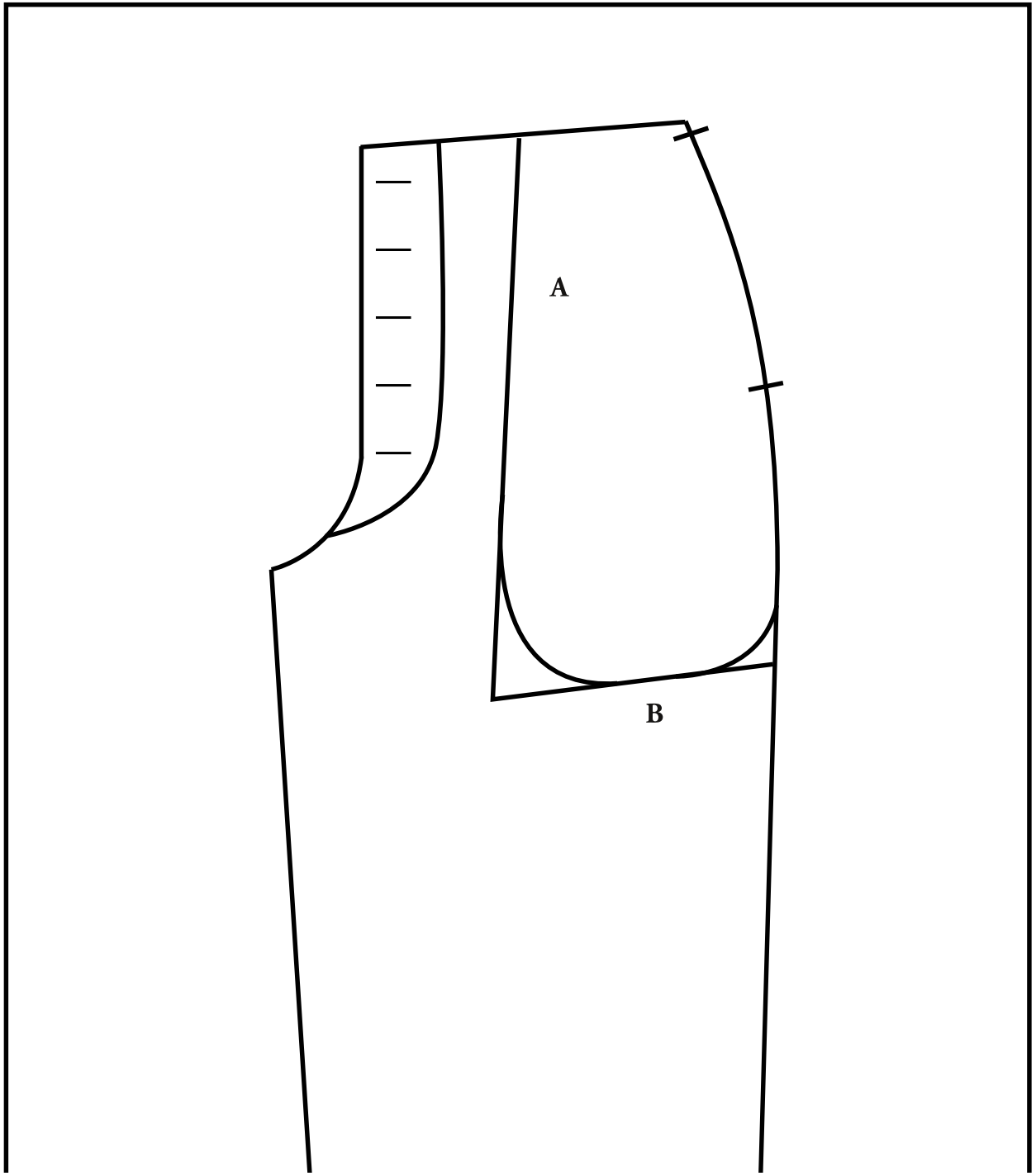


The Complete Draft

Here is a larger sized draft for you to study in more detail. At this point you'll want to trace each piece onto a fresh sheet of paper, and add .25 inch seam allowances around.



Drafting the Fly and Pockets



The Fly

I like to make my flys 1 1/4 inch wide. Start by drawing a line parallel to the plum line. At the bottom, it curves in rather sharply, meeting the crutch at a point. Space the buttonholes a quarter inch from the outside edge, generally 3/4 inch wide. Spacing depends on how large the rise of the pants is.

Pockets

Start by drawing line A from about the middle of the waist seam, to the depth you would like the pocke to be.

Line B connects to the side seam at an upward angle. This allows any change or small items to fall into the pocket, preventing you from losing them.

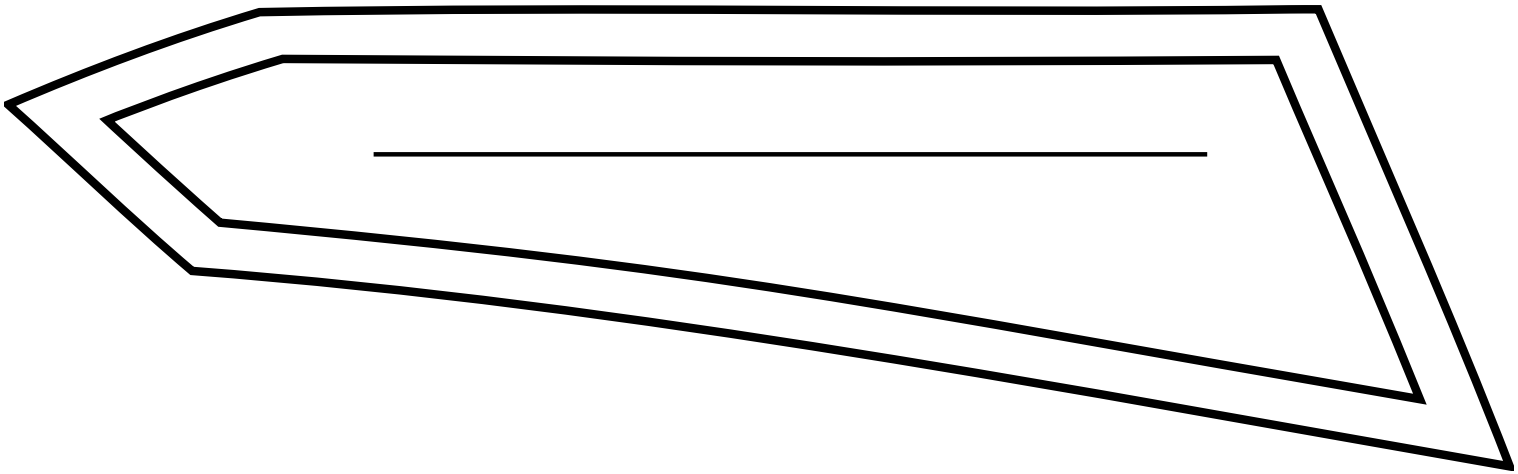
Next, draw some nice curves at each corner, as shown.

The pocket opening is generally about 8 inches, depending on the hand size. I like the pocket to hang 5 inches below that, for a total length of 13 inches. This gives me plenty of room for things.

Line A should be placed on the Grain, to prevent the pocket from stretching.

A Trouser Buckle

The original source for this came from Salisbury's system of drafting. However, it didn't quite work, being not long enough, and too thick for a buckle. After some modifications, this is the result. .25 inch seam allowance included.



About the Author

My young eyes were introduced to the world of tailoring and living history at the age of five. While at the Nathan Hale Homestead in Coventry, Connecticut, I was awestruck by the colourful and handsome uniforms worn by so many of the reenactors. It was at this point that I wanted to go home and become famous, like Nathan Hale himself, so I could wear clothing like that every day.

Of course, that never happened. I took up some hobbies such as needlepoint, and such over the years, but it wasn't until 8 years later that I would take my first steps towards becoming a historic tailor. I entered a fife and drum corps that had been formed at my school, and several years later, began reenacting with the 5th Alabama Field Music. During these years, I learned to make shirts for use with both corps.

Finally, I was introduced to the citizen's side of living history, by my good friend Megan Clark, a wonderful milliner and dress maker. I of course had absolutely nothing to wear, so hastily bought several yards of a cheap polyester wool blend, and a frock coat pattern, and made myself a poor excuse of a frock coat and trousers.

At the time, I thought they were wonderful, but I gradually started learning more about men's clothing, and becoming aware of the inaccuracies of my own. Poking around the sutler's tents at Cedar Creek one year, I came across The Handbook of Practical Cutting, by Louis Devere. This is what unlocked the doors to the world of tailoring for me. Later that year, I drafted a paletot, waistcoat, and trousers from his system, and was delighted with the results.

From that year on, I've been furthering my study of men's garments of the period, both by studying originals wherever they can be found, and reading period tailors manuals. It became clear to me that there was a need for accurate clothing in the citizens world. Too many shortcuts and inaccuracies were found in the vast majority of reproductions, such as the lack of chest canvas, no pad stitching in collars, and too much use of the sewing machine. Especially on buttonholes.

In 2008, I decided make my hobby into a business, and formed Williams Clothiers, LLC. My first task was a large one, making two dozen bespoke Federal Enlisted Frock coats and trousers for Connecticut Valley Field Music. During the process, I was able to perfect my fitting process, stitches, construction steps, ironwork, and more. I learned something new with each coat I made, and I endeavored to make each one better than the last.

The love and care I put into each one of those coats is carried on today with what I can make for you. If you are looking for an extremely well-crafted garment for your living history needs, you have come to the right place. I invite you to contact me, and set up an appointment for a fitting today.

Thank you,
James Williams