



Fiona Ellis is the author of today's post, where we hear about how geometry is a knitter's best friend, especially when trying to create innovative [shapes](#) and [patterns](#) in your creations. Fiona is a design superstar, having contributed a [number](#) of [amazing](#) patterns [to](#) our [magazine](#), as well as some extremely lovely [publications of her own](#). Keep up with Fiona's latest by following her on [Twitter](#).



I totally hated mathematics in school. So it amuses me how the calculations I leaned back then play such big a part in my work today. For some reason the principles that made me feel like I was in a thick fog once upon a time now make total sense once I apply them to knitting. It doesn't even feel like math to me now- it feels like simple common sense.

So you can imagine that I get a huge kick out of explaining in my workshops that when you are

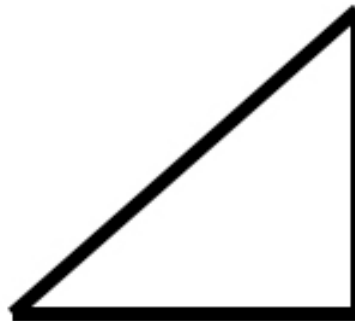
figuring out the shaping of say an armhole that you are really sort of calculating the hypotenuse of a series of triangles. I love that word “hypotenuse” and love being able to use it in a knitting class. I always joke that I can calculate one but I just can’t spell it (but obviously I do know how to look up the spelling for the purpose of this piece).

Of course this is geometry and it is also at play when figuring out the angle of a line that you may wish to make when designing a cable – what I call drawing with cable “cords”. If you need a steep angle for your line you move the cord over by just one stitch at a time, if you need a shallower angle then you move the cord by two or maybe three stitches at a time. The real fun begins when you use them in combination with each other to create many different shapes.

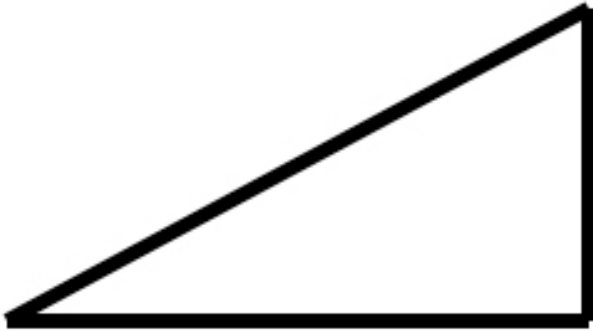
**Steep angle**  
cord moved by  
one stitch |



**Shallower angle**  
cord moved by  
two stitches



|Even shallower angle  
cord moved over  
by three stitches



I used this idea when I sat down to design the paisley cable motif in [Paisley](#). As I already knew how I was going to approach the task it meant that I ended up having to make far fewer swatches than if I have done it by trial and error alone. Aesthetics play their part after the first swatches or two. There is still some back and forth once you see how the lines look knit up at the gauge you will be working in. You still need to make it look as pretty as possible or in this case to make a motif that resembles the paisley we know and love.

