

## Tuesday Group Work

### Part D:

STUDENT: If you change the angle that you have it at...

STUDENT: And so that way, those two lines are parallel.

STUDENT: Uh-huh. So if you have something see, like this then you change it like this. See, like this. If you got these two, it'll be parallel.

STUDENT: And if you change one a little bit like that.

STUDENT: Just a little bit and then it wouldn't be parallel. It would be parallel with this one but not this way. You would have a trapezium, exactly.

STUDENT: I am writing this down.

STUDENT: So you guys think that any rhombus we get or kite we get is also a rhombus, like exactly the same rhombus. So since we've been using...we know that using these two diagonals we get a kite or a rhombus depending on where we put them. So...but what would happen if you leave them off? Like, if it wasn't to the mid-point of the diagonal or the mid-point of this one? So the thing that I noticed was that when we had either a rhombus or a kite, this was...we always used the mid-point of this diagonal. So what if it wasn't at the midpoint of the diagonal? What if it was something like that? It would still be a trapezoid right? So you can also use the two diagonals you get from making a rhombus or a kite; you can also use them to make a trapezoid or a trapezium.

STUDENT: Okay, I am writing it down.

STUDENT: So any two diagonals that produce a rhombus or a kite may also be used to produce, I think is one any trapezoid or trapezium. So what do you guys...I guess that was just one of those...

STUDENT: AHA moments?

STUDENT: AHA moments! Yeah, one of those eureka moments. I don't know what that really tells us about...

STUDENT: I think it was like a small goal.

STUDENT: Yeah. So we have two diagonals that make two sets of polygons and we have two observations that pertain to these two. So I think we should start working on these two sets of diagonals more than the larger ones because with these ones we only have one set of observations; and with these two we have two whole sets of observations. So I think we should tinker with these two sets to see what we can get.

STUDENT: The only thing that we haven't made with those two is a square and a rectangle.

STUDENT: I made a square.

STUDENT: With these? How?

STUDENT: Oh, I thought you meant in all.

STUDENT: No, I meant with these two because we had two observations that pertain to two sets.

STUDENT: But it is impossible to make a square with this because all sides are equal, making the diagonals equal.

STUDENT: So this has to be...so you can't make a square or a rectangle.

STUDENT: Let's see.

STUDENT: These two can't produce a square so um, diagonals used in producing kites, rhombus, trapezoids or trapeziums cannot produce...

STUDENT: Okay, so here we go – can't make a square without equal diagonals.

STUDENT: Can't produce a square or a rectangle. Can it make a parallelogram?

STUDENT: Yeah.

STUDENT: Can these two make a parallelogram? I know that two large diagonals can make a parallelogram. Okay no. But we can also get a parallelogram with these two.

STUDENT: Right.

STUDENT: So now we have a third set of observations that have to do with the large set of diagonals.

STUDENT: I'm going to tinker some more.

STUDENT: I want to find out why the only type of parallelogram that we can't actually make is a parallelogram. That's confusing. So we can make a square or rectangle but not a parallelogram.

STUDENT: You did make one.

STUDENT: Oh, so we can make a parallelogram.

STUDENT: Yeah, we can make a parallelogram but not a square.

STUDENT: So out of all the shapes we've made, we produced everything except a square and a rectangle out of these two.

STUDENT: Yeah.

STUDENT: And trapeziums.

STUDENT: Yeah, we can make a trapezium.

STUDENT: Oh, I thought you said that you could.

STUDENT: No, with these two we can make a trapezium easy.

STUDENT: And the rhombus, and the kite and the trap and the parallelogram, except not a square or a rectangle because they're not equal. The other observations we have that we're wondering about...

STUDENT: Did I make another trapezium or is that the...?

STUDENT: Yeah, that is another trapezium.

STUDENT: They should be pretty straight because this is like down at an angle but straighter.

STUDENT: Like I said...most common.

STUDENT: Yeah, the trapezium that we had...there are all sorts of shapes that just don't work. You can't define them. The only one we messed up on was the trapezium.

STUDENT: We can get the trapezium right?

STUDENT: Yeah, because we don't know if two lines are parallel so we can't really...

STUDENT: What would this be?

STUDENT: That would be a parallelogram. See, two angles are...that is the exact same angle and those would be parallel to each other; and so are those actually. See, these two and those two would be parallel.

STUDENT: It has to be in the middle?

STUDENT: Wait, is it off the middle of both of them?

STUDENT: Yeah.

STUDENT: So you would get it pretty much the same way you would get a kite.

STUDENT: So this is a rhombus right here and if you turn it then you get a parallelogram.

STUDENT: And does it work if you turn it any other way? Even if you move the angle a little bit away, just a tiny bit away, you still get a parallelogram.

STUDENT: Yeah.

STUDENT: So from a rhombus you can also produce a parallelogram. Oh, we know that because of the observation we had with the kite. Essentially we are using the same steps. But

what about through a kite, through a kite can you make a parallelogram? Like through the kite thing would this...

STUDENT: Well, because they're not equal. I think you can. It does kind of look like it.

STUDENT: No, because this angle is not straight.