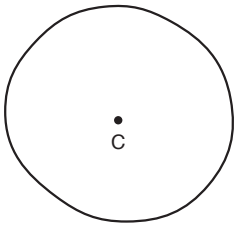
APPENDIX 1

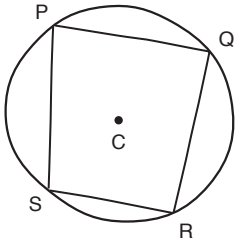
Item G1 (right) was used in the Year 8 and Year 10 proof tests for the Longitudinal Proof Project. We discuss the item in chapter 8 (page 8.4).

On this page (below) we show selected 'Yes' responses to the item; on the next page we show selected 'No' responses. The responses can be used with students to help them develop an awareness of the different qualities of students' written explanations (see chapter 7).

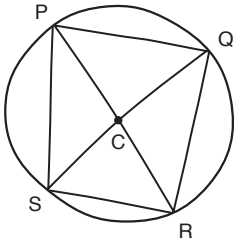
Darren sketches a circle. He calls the centre C.



He then draws a quadrilateral PQRS, whose corners lie on the circle.



He then draws the diagonals of the quadrilateral.



Darren says
"Whatever quadrilateral I draw with corners on a circle, the diagonals will always cross at the centre of the circle".

Is Darren right? .....

Explain your answer.

Is Darren right? Yes...

Explain your answer.

Because all quadrilaterals have 4 sides the diagonals always have to go from one side of the circle to the opposite side, so the diagonals always have to go through the centre.

A

Is Darren right? ...Yes...

Explain your answer.

The quadrilaterals corners are on the edges of a circle so they will have the same centre point as the quadrilateral.

C

Is Darren right? ...Yes...

Explain your answer.

Because one diagonal going across the circle is like the diameter.

B

Is Darren right? Yes...

Explain your answer.

Because what ever way you look at the shape the corners are allways going to be in line with the centre.

D

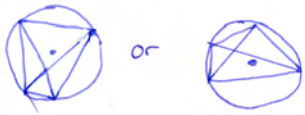
APPENDIX 1, continued

Selected 'No' responses to item G1:

Is Darren right? No....

Explain your answer.

It depends where the corners of the quadrilateral lie. If they are not completely opposite one another the diagonals will miss the centre of the circle.
e.g.

 or

E

Is Darren right? No....

Explain your answer.

because a quadrilateral is a shape with 4 sides but it doesn't mean they have to be equal.

H

Is Darren right? No.....

Explain your answer.

If the opposite corners aren't opposite eachother the diagonals will not intersect ~~on the edge~~ at the centre of the circle.

F

Is Darren right? No....

Explain your answer.

The corners could all be above or below the center, taking up less than half of the circle

I

Is Darren right? ~~Yes~~ No.....

Explain your answer.

Because all the corners can touch above the centre of the circle

eg.

G

APPENDIX 2

Item G2b (right) was used in all three proof tests for the Longitudinal Proof Project. We discuss the item in chapter 8 (page 8.5).

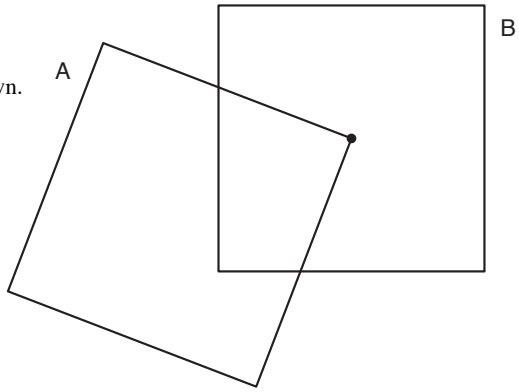
On this page (below) and the next, we show selected responses to the item. The responses can be used with students to help them develop an awareness of the different qualities of students' written explanations (see chapter 7).

One corner of tile A is moved to the centre of tile B, as shown.

What fraction of tile B is overlapped by tile A ?

. . . . . .

Explain your answer.



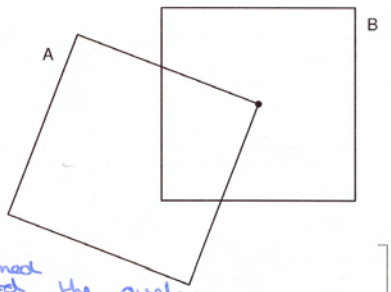
One corner of tile A is moved to the centre of tile B, as shown.

What fraction of tile B is overlapped by tile A ?

1/4

Explain your answer.

If you ~~moved~~ turned the overlapping square round so that the sides are parallel to the other square it will be clear that the a quarter is overlapping.



G26CM01

A

One corner of tile A is moved to the centre of tile B, as shown.

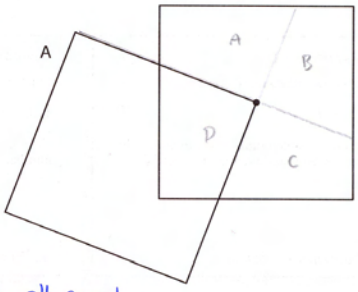
What fraction of tile B is overlapped by tile A ?

1/4

Explain your answer.

A, B, C, D are all equal.

There are 4 of them so they must be quarters.



G26GH30

C

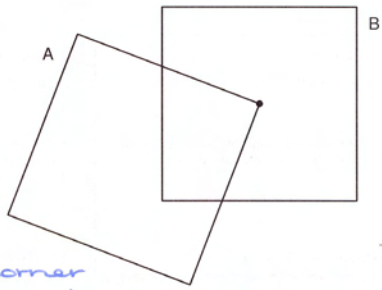
One corner of tile A is moved to the centre of tile B, as shown.

What fraction of tile B is overlapped by tile A ?

1/4

Explain your answer.

Because the corner of the square is a right angle (90°) and so a 90° angle is overlapped which is a quarter. (1/4)



G26PC01

B

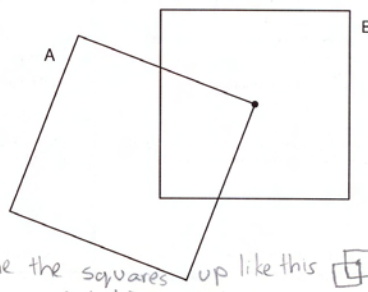
One corner of tile A is moved to the centre of tile B, as shown.

What fraction of tile B is overlapped by tile A ?

1/4

Explain your answer.

Because if you line the squares up like this (~~the~~ Square A being rotated) then it covers 1/4 because ~~they~~ the corner of A is exactly in the centre of B. Therefore, no matter where A moves, so long as 1 corner is in the centre of B, it will always cover 1/4



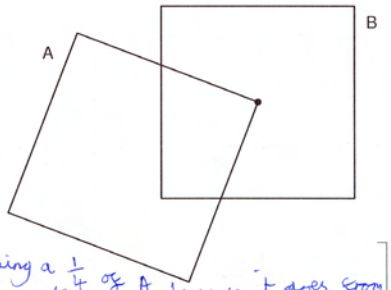
G26JC30

D

APPENDIX 2, continued

More responses for item G2b:

One corner of tile A is moved to the centre of tile B, as shown.



What fraction of tile B is overlapped by tile A ?

1/4

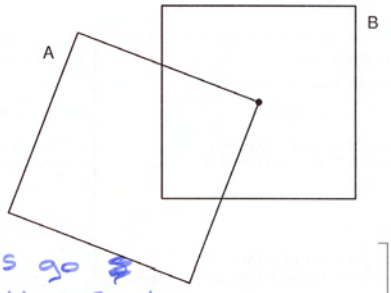
Explain your answer.

It must be overlapping a $\frac{1}{4}$ of A because it goes from the centre so only one quarter of the tile can possibly overlap.

G2bC20Y8RM05

E

One corner of tile A is moved to the centre of tile B, as shown.



What fraction of tile B is overlapped by tile A ?

1/4

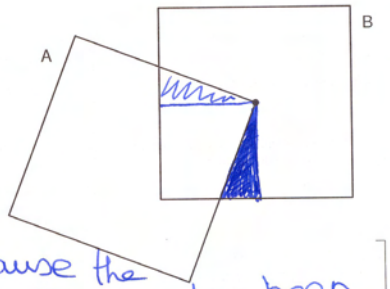
Explain your answer.

The two lines go straight to the centre. We can see the shape made would roughly fill the tile 4 times

G2bSM01

H

One corner of tile A is moved to the centre of tile B, as shown.



What fraction of tile B is overlapped by tile A ?

1/4

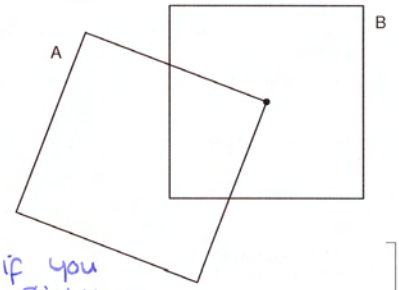
Explain your answer.

This is because the fully shaded area has been moved to the non full area that is shaded. so the area stays the same and so does the side.

G2bSA01

F

One corner of tile A is moved to the centre of tile B, as shown.



What fraction of tile B is overlapped by tile A ?

1/4

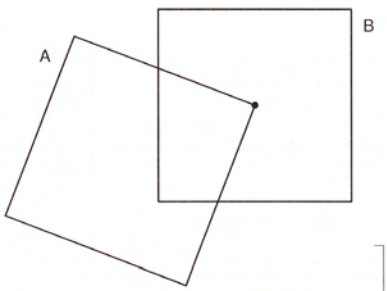
Explain your answer.

Because if you moved the tile slightly you would be able to see more clearly that $\frac{1}{4}$ of the tile is being overlapped.

G2bSR01

I

One corner of tile A is moved to the centre of tile B, as shown.



What fraction of tile B is overlapped by tile A ?

1/4

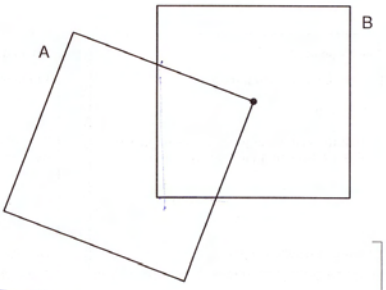
Explain your answer.

Because the angle of the corner is 90° & is coming from the centre of square and which is 360° and $\frac{90}{360} = \frac{1}{4}$

G2bSMc01

G

One corner of tile A is moved to the centre of tile B, as shown.



What fraction of tile B is overlapped by tile A ?

1/4

Explain your answer.

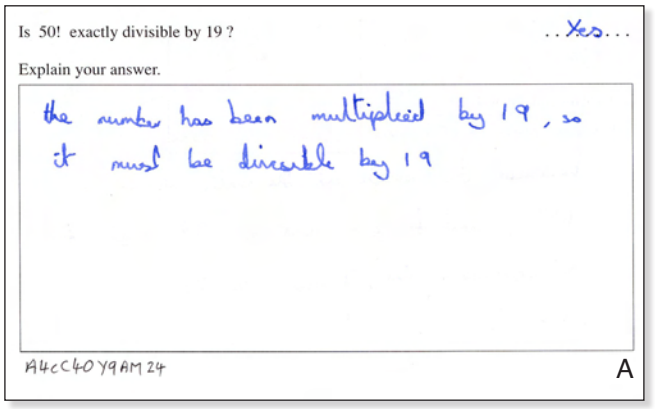
G2bY8c31RB26

J

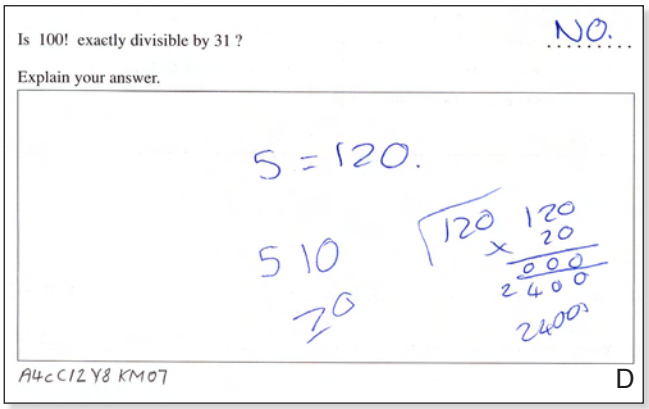
APPENDIX 3

Question A4 was used in the Year 8 and Year 9 proof tests for the Longitudinal Proof Project. In part c) students are asked whether 100! is divisible by 31 (Year 8) or whether 50! is divisible by 19 (Year 9). We discuss the item in chapter 8 (page 8.5).

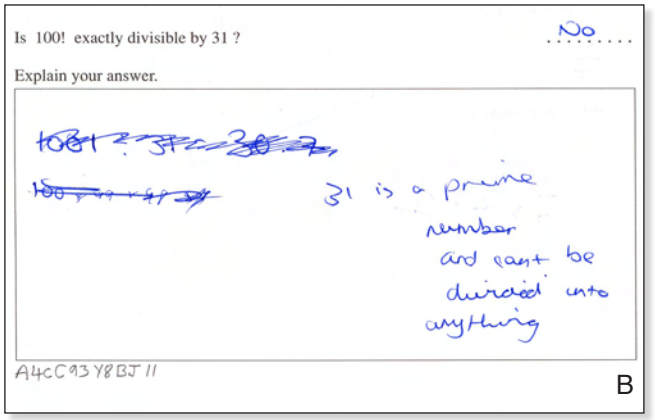
Selected responses to item A4c are shown below. The responses can be used with students to help them develop an awareness of the different qualities of students' written explanations (see chapter 7).



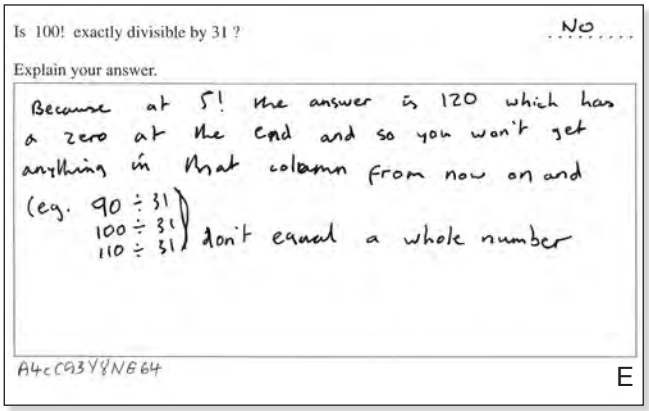
A



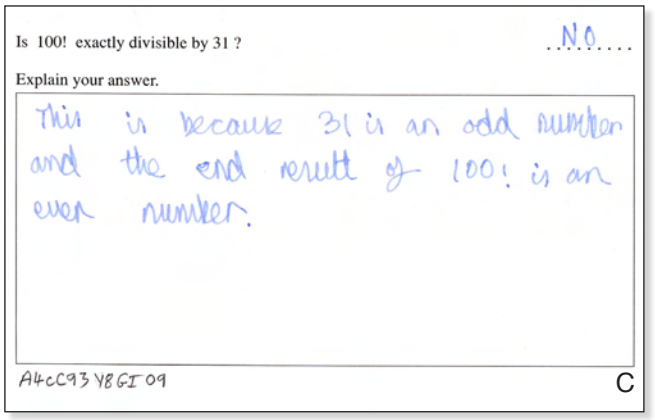
D



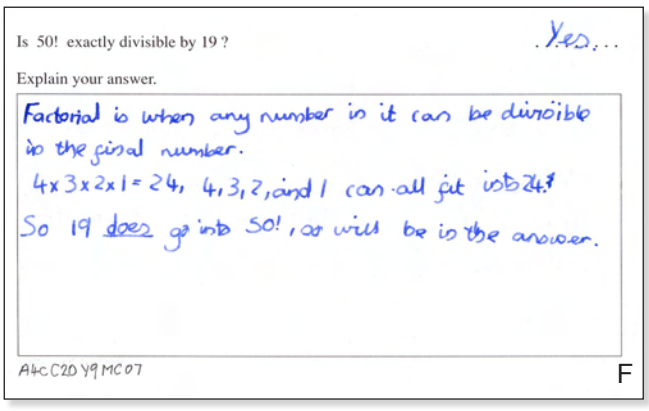
B



E



C



F