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| --- | --- |
| EGC_Black | Student Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    **Eastern Goldfields College**  Mathematics Methods 2019  Investigation 2 Shading Squares Part A1 |
| There are two parts to this investigation. Part A is a take-home assignment, of which you have one week to complete. I will check your work in class on **Monday 1st April.**  The solutions to Part A will be posted on the pin up board outside the Mathematics Office on the morning of **Tuesday 2nd April**  Part B is an in-class investigation . You will be allowed to use your Part A while completing the validation on **Thursday 4th April**.  **Weighting 5%** | |



Two-fifths () of this shape has been shaded.

1. How many different ways can  of this shape be shaded?

List the possibilities.

*(Hint: let the squares be 1, 2, 3, 4 and 5, therefore the shading of the shape above could be coded as 2, 5).*

2. Complete the table below for  of a shape. (Note: you completed this for homework and one of them is done for you)

|  |  |  |
| --- | --- | --- |
| n | Possible ways of shading shape | **Total number of ways (S) of shading  of the shape** |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 | 1,2 1,3 1,4 1,5 2,3 2,4 2,5 3,4 3,5 4,5 | 10 |
| 6 |  |  |

3. Write a rule for S in terms of n, ie, S(n) = ?

4. Complete the table below using your answers above from the table for  and calculating the indicated difference patterns.

|  |  |
| --- | --- |
| n | S(n) |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |

1st Diff

2nd Diff

What type of function is S(n)?

5. Complete the table below for the general quadratic *y* = ax2 + b*x* + c

|  |  |
| --- | --- |
| *x* | *y* |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |

1st Diff

2ndDiff

6. Compare your tables from questions 4 and 5 and write down a system of three equations to solve for variables a, b and c

7. Solve these equations

8. Use these values of a,b and c to write a quadratic rule for S(n):

S(n) = a*n*2 + bn + c

=

9. Factorise your rule from question 8.

10. Compare this rule with the rule you found via another method in question 3.