

**8A**

**Year 8 Maths ILA (Units 13/14)**

**Mathslinks 8A Book**

**Unit 13 (Algebra) & Unit 14 (SSM)**

Level 5 Level 5

**ONLY USE A CALCULATOR WHERE YOU SEE THIS SYMBOL C:\Users\cblaymire\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\C0A4LQYK\MC900389698[1].wmf**

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| **What is the purpose of this ILA?** | |
| * To encourage independent learning by students outside the classroom. * To develop a stronger understanding of algebra and shape, space and measure work at level 5. | |
| **What is expected from you?** | |
| * To complete your own work, to the best of your ability, with pride. * To show clear methods; show **all** your working out not just the answer. * Some students may struggle. If you find yourself “in the pit” you need to find a way out. * The Investigation is an important part of the ILA and must be attempted, showing reasonable effort. | |
| **Where can you get help?** | |
| * Look at the 8A Maths Links book (units 13 and 14). * Use the Maths ILA/homework Club after school on Tuesdays in S1. * Use the Unity College VLE (KS3). * Use the Learning Zone before or after school (8.00-8.35 Mon - Fri and 3.10-4.30 Mon - Thurs). * Use MyMaths.co.uk and Sam Learning. * Seek extra help at the Maths ILA Club. You are **expected** to attend to complete any parts you struggle with. | |
| **Learning Objectives** | |
| **Algebra**   1. To be able to simplify or transform linear expressions by collecting like terms. 2. To be able to read from linear graphs and use mapping to help plot linear graphs. 3. To be able to plot the graphs of simple linear functions.   **SSM**   1. To know and use the formula for the area of rectangles and to be able to calculate the area of shapes made from rectangles. 2. To be able to imagine 3D shapes from 2D drawings. 3. To be able to find the surface area of cubes and cuboids. | Level 5a  Level 5a  Level 5b  Level 5b  Level 5a  Level 5a |
| **Hints and Tips** | |
| * You can only collect terms that are the same, for example y + y + y = 3y. * Area is the inside of the shape. * Surface area is the area of the net. | |
| **Keywords** | |
| |  |  |  | | --- | --- | --- | | like terms | area | 2D (two dimension) | | simplify | surface area | 3D (three dimension) | | collecting |  |  | |  |  |  | | |

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| **Learning Objective 1. To be able to simplify or transform linear expressions by collecting like terms. Level 5a** |

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| 1.  a.  b.  c.  d.  e. | Simplify each of the following expressions:  5*a* + 2*b* − 2*a* + *b*  5*a* + 2*b* − 2*a* + *2b*  5*t* + 2*s* + 3s + *2t*  7*b* + 2*b* − 2*a* + 2*a*  3*m* + 9*n* – 8*m* + 2*i* | (5 marks) |
| 2.  a.  b.  c.  d. | Simplify each of the following expressions:  2*a* × 3*b*  3*a* × 3  5*a* × 3*b*  4*q* × 3*r* | (4 Marks) |
| 3.  a.  b.  c.  d. | Simplify each of the following expressions:  2*a* ÷ 2  12*n* ÷ 3  *25t* ÷ 5  45*e* ÷ 5 | (4 marks) |
| 4.  a.  b. | Chi goes to the shops and buys a packet of fruit jellybeans. There are *x* jellybeans in the packet. She then gives 10 away to her friend.  How many jellybeans does Chi have now?  Give your answer in terms of *x*.  She now has 26 jellybeans left. Work out how many jellybeans did Chi bought originally. | (2 marks)  (2 marks) |
| **Learning Objective 2. To be able to read from linear graphs and use mapping to help plot linear graphs. Level 5a** | | |

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| 5.  a.  b. | Here is the graph of an equation relating *x* and *y*.  ../../../Illustrations/8A%20Assessment/JPEG/aw_ox_mla8_13a4_te_4.jpg  Write the coordinates of the five points on the graph in the following table. One point has been done for you:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | ***x*** | 0 |  |  |  |  | | ***y*** | 3 |  |  |  |  |   Without using the graph can you state how you could find the y value if you knew the x value? | (4 marks)  (2 marks) |
| 6. | Two variables, *x* and *y* are connected by this mapping.  **To find the *y*-value, multiply the *x*-value by 2 and subtract 1.**  For this mapping, complete the table below. Part of it has been done for you.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | ***x*-coordinate** | 1 | 2 | 3 | 4 | | ***x* × 2** | 2 | 4 |  |  | | **− 1** | −1 | −1 |  |  | | ***y*-coordinate** | 1 | 3 |  |  |   Plot the points on the grid below and join them to draw the graph of y = 2*x* − 1.  ../../../Illustrations/8A%20Assessment/JPEG/aw_ox_mla8_13a5_te_1.jpg | (2 marks)  (2 marks) |
| **Learning Objective 3. To be able to plot the graphs of simple linear functions. Level 5b** | | |

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| 7.  a. | The minute hand of a clock completes a full circle in 60 minutes. This means that every five minutes the minute hand moves through an angle of 30°.  aw_ox_mla8_13a4_te_1  Complete this table to show the **total** number of degrees moved through every 5 minutes:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Time (mins)** | 5 | 10 |  |  |  |  | | **Angle (degrees)** | 30 | 60 |  |  |  |  | | (4 marks) |
| b. | Plot the points in (a) on the axes below and hence draw the graph of angle against time.  ../../../Illustrations/8A%20Assessment/JPEG/aw_ox_mla8_13a5_te_2.jpg  How many minutes have passed when the hands are 270° apart? | (2 marks)  (2 marks) |
| 8. | Complete the table below for the linear equation:  y = 3*x* + 2.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | *x-coordinate* | 0 | 1 | 2 | 3 | 4 | 5 | |  |  |  |  |  |  |  | |  |  |  |  |  |  |  | | *y-coordinate* |  |  |  |  |  |  |   Now plot the graph below for the linear equation y = 3*x* + 2. | (6 marks)  (2 marks) |

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| **Learning Objective 4. To know and use the formula for the area of rectangles and to be able to calculate the area of shapes made from rectangles. Level 5b** |

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| 9.  a.  b.  3 cm  c. | Calculate the area of each of the following shapes **(not drawn to scale):**  14 cm  5 cm  **Answer \_\_\_\_\_\_\_\_\_\_\_\_ cm2**  8 cm  9 cm    5 cm  **Answer \_\_\_\_\_\_\_\_\_\_\_\_ cm2**  6 cm  5 cm  4 cm  3 cm  7 cm  3 cm  **Answer \_\_\_\_\_\_\_\_\_\_\_\_ cm** | (1 mark)  (2 marks)  (3 marks) |
| **Learning Objective 5. To be able to imagine 3D shapes from 2D drawings. Level 5a** | | | |

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| 10.  a.  b.  c.    d. | What is the name of the solid shape that can be made from the following nets:  **Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | (4 marks) |
| **Learning Objective 6. To be able to find the surface area of cubes and cuboids. Level 5a** | | |

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| 11.  a.  b.  c. | What is the surface area of the following cuboids:  4 cm  2 cm  1 cm  **Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm2**  6 cm  3 cm  1 cm  **Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm2**  3 cm  3 cm  3 cm  **Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm2** | (6 marks) |

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| **Investigation** |

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| 1.  2. | Construct the following triangle accurately in the space below using a ruler and protractor:  6 cm  4 cm  80°  Construction rods  You have 6 construction rods with a hole at each end, which enables them to be fixed together. When you measure the distance between the holes you find that:  three have a 3cm gap  two have a 4cm gap  and one has a 5cm gap between the holes.  Investigate how many different sized triangles you can make using these construction rods. (It may help to draw your diagrams to scale.)  3 cm  •  • •x 3 e.g.  4 cm  • • x 2  5 cm  • • x 1  •  •  • | (4 marks)  (6 marks) |

**Year 8 ILA – Mathslinks Book 8 Units 13 & 14**

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| **Level** | **Learning Objective** | **Pupil Assessment** | **Teacher Assessment** |
| 5a | To be able to simplify or transform linear expressions by collecting like terms. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 5a | To be able to read from linear graphs and use mapping to help plot linear graphs. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 5b | To be able to plot the graphs of simple linear functions. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 5b | To know and use the formula for the area of rectangles and to be able to calculate the area of shapes made from rectangles. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 5a | To be able to imagine 3D shapes from 2D drawings. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 5a | To be able to find the surface area of cubes and cuboids | ☹ 😐 ☺ | ☹ 😐 ☺ |

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| **Parental Comment** |
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| **Teacher General Comment** |
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| **Teacher Investigation Comment** |
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