**APPROXIMATE INTEGRATION:TRAPEZIUM RULE and SIMPSON’S RULE.**

 ***y***

 7 5 3 5 7 9 13

 2 8 14 20 26 32 38 ***x***

 h h h h h h

 h = interval between *x* values = 6 in this case

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *x* | 2 | 8 | 14 | 20 | 26 | 32 | 38 |
| *y* | 7 | 5 | 3 | 5 | 7 | 9 | 13 |
| **HINT**: Label *y* values to fit the formulae or you will get mixed up! | ***y0*** | ***y1*** | ***y2*** | ***y3*** | ***y4*** | ***y5*** | ***y6*** |

 **First + Last + 2×(rest of *y* values)**

**Trap Rule** AREA ≈ *h y0 + yn + 2( y1 + y2 + y3 + ……..)*

 *2*

 *= 6 7 + 13 + 2( 5 + 3 + 5 + 7 + 9)*

 *2*

 *= 3 20 + 2( 29 )*

 *= 234*

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 **First + Last + 4×odd y values + 2×even y values**

**Simps Rule** AREA ≈ *h y0 + yn + 4( y1 + y3 + y5 …) + 2(y2+ y4 + y6 ….)*

 *3*

 *= 6 7 + 13 + 4( 5 + 5 + 9) + 2(3 + 7)*

 *3*

 *= 2 20 + 4 ( 19 ) + 2 ( 10 )*

 *= 232 units2*