| C | S3 Nat 5 Non-Calculator Revision | 30 |
| :---: | :---: | :---: |
| 1 | Evaluate $1 \frac{1}{8} \div \frac{3}{4}$ | 2 |
| 2 | Factorise <br> (a) $x^{2}-1$ <br> (b) $x^{2}-5 x-6$ | 4 |
| 3 | Write $x^{2}-4 x+7$ in completed square form $(x+a)^{2}+b$ | 2 |
| 4 | Multiply out the brackets and collect like terms $(2 x-1)(4 x+5)-3\left(x^{2}+1\right)$ | 3 |
| 5 | A right-angled triangle has the dimensions: <br> - $A B$ is $\sqrt{50}$ <br> - CB is $\sqrt{32}$ <br> Calculate the length of $A C$, give your answer as a surd in the simplest form. | 3 |
| 6 | Change the subject of the formula $S=\frac{3}{4} a-t^{2}$ | 3 |
| C | S3 Nat 5 Calculator Revision |  |
| 7 | Bacteria in a petri dish increase at a rate of 5\% per hour. At 12 noon there are 4000 bacteria in the petri dish. How many bacteria will be present at 2.00 pm ? | 3 |
| 8 | Calculate the length of the space diagonal of this cuboid (the dotted line). Give your answer as a surd and as a decimal | 4 |
| 9 | Sketch a possible graph to represent $y=\mathrm{m} x+\mathrm{c}$ where m is less than zero and c is greater than zero. | 2 |
| 10 | Calculate the volume of a hemisphere which has a diameter of $6.4 \times 10^{3}$ metres Give your answer in scientific notation correct to 2 significant figures. | 4 |


|  | Answers |
| :---: | :---: |
| 1 | $1 \frac{1}{8} \div \frac{3}{4}=\frac{9}{8} \times \frac{4}{3}=\frac{3}{2}$ |
| 2 | (a) $(x+1)(x-1)$ (b) $(x-6)(x+1) \quad 30$ |
| 4 | $8 x^{2}+10 x-4 x-5-3 x^{2}-3=5 x^{2}+6 x-8$ |
| 5 | $\begin{gathered} (\sqrt{50})^{2}=(\sqrt{32})^{2}+A C^{2}, \quad 50=32+A C^{2}, \quad A C^{2}=50-32, \\ A C^{2}=18, \quad A C=\sqrt{18}, \quad A C=\sqrt{9} \sqrt{2}=3 \sqrt{2} \end{gathered}$ |
| 6 | subtract $t^{2} \quad S-t^{2}=\frac{3}{4} a$, multiply by 4 and divide by $3 \quad a=\frac{4}{3}\left(S-t^{2}\right)$ |
| 7 | $105 \%$ of $4000=4000+200=4200,105 \%$ of $4200=4200+210=4410$ bacteria Or $4000 \times 1.05^{2}=4410$ bacteria |
| 8 | The space diagonal is $\sqrt{8^{2}+6^{2}+5^{2}}=\sqrt{125}=\sqrt{25} \sqrt{5}=5 \sqrt{5}=11.2 \mathrm{~cm}$ |
| 9 | If the gradient is negative then the line slopes down. If c is positive then the line crosses the $y$-axis anywhere above the origin ( $x=0$ ) |
| 10 | Volume of a hemisphere is $\frac{4}{3} \times \pi \times r^{3} \div 2$, $V=\frac{4}{3} \times \pi \times\left(3.2 \times 10^{3}\right)^{3} \div 2=6.8629 \ldots \times 10^{10} \text { Volume is } \mathbf{6 . 9} \times \mathbf{1 0}^{\mathbf{1 0}} \boldsymbol{m}^{\mathbf{3}}$ |


| Extra Help from mathsworkout.co.uk.School login is madrascol school password is value28 <br> 1 Changing the subject |  | Algebra: topic 11 Any Level 5 tasks |
| :--- | :--- | :--- |
| 2 | Completing the square | Algebra: topic 12 Completing the Square (level 7) |
| 3 | Expanding Brackets | Algebra: topic 12 Expanding Brackets (Level 4) |
| 4 | Factorising | Algebra: topic 12 Factorising Quadratics (Level 5) |
| 5 | Fractions | Number: topic 14 - Add, Subtract, Multiply and Divide |
| 6 | Percentages | Ratio: topic 7 Percentage increase and decrease |
| 7 | Straight Lines | Graphs: topic 2 <br> Calculating the Gradient <br> - Equation of a Straight Line 1 and 2 |
| 8 | 3D Pythagoras | Volume |
| 9 | Geometry: topic 19 Pythagoras in 3D |  |

