

**YEAR 13 – MATHEMATICS (Week 26)**

<b>Subject</b>	<b>Mathematics</b>
<b>Class/ Section</b>	<b>Year 13 – Batch A, B and C</b>
<b>Week</b>	<b>21<sup>st</sup> February to 25<sup>th</sup> February 2021</b>
<b>Work send to students by</b>	<b>Group email / Google classroom / Zoom</b>
<b>Total number of lessons per week</b>	<b>3</b>
<b>Units</b>	<b>Pure Mathematics – Year 2 Chapter 11 – Integration Chapter 12 - Vectors</b>
<b>Lesson 1 – Live Zoom lesson</b>	<b>11.10 – Solving differential equations 11.11 – Modelling with differential equations</b>  <b><u>Learning objective</u> – To solve simple differential equations and model real-life situations with differential equations.</b>  <b><u>Intended Learning Outcomes</u></b>  -- Students will be able to understand that integration can be used to solve differential equation. We can solve first order differential equations by separating the variables. $\frac{dy}{dx} = f(x)g(y) \text{ can be written as}$ $\int \frac{1}{g(y)} dy = \int f(x)dx$  Sometimes we are interested in one specific solution to a differential equation. We can find a particular solution to a first-order differential equation if we know one point on the curve. This is sometimes called a boundary condition. Differential equations can be used to model real-life situations.  <b>Tasks</b>  To complete the questions assigned from the Textbook (pdf) in their notebook. Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.  <b>Resources</b> <ol style="list-style-type: none"><li>1 Power point presentation</li><li>2 Pure Mathematics Year 2</li><li>3 <a href="https://www.physicsandmathstutor.com/">https://www.physicsandmathstutor.com/</a></li><li>4 <a href="https://www.drfrstmaths.com/">https://www.drfrstmaths.com/</a></li><li>5 <a href="https://www.examsolutions.net/">https://www.examsolutions.net/</a></li></ol>

<p><b>Lessons 2 –Live Zoom lesson</b></p>	<p><b>12.1 – 3D Coordinates</b>  <b>12.2 – Vectors in 3D</b></p> <p><b><u>Learning objective</u> – To understand 3D Cartesian coordinates and to use vectors in three dimensions.</b></p> <p><b><u>Intended Learning Outcomes</u></b></p> <p>-- Cartesian coordinate axes in three dimensions are usually called x-, y- and z-axes, each being at right angles to each of the others. The coordinates of a point in three dimensions are written as (x, y, z). The distance from the origin to the point (x, y, z) is <math>\sqrt{x^2 + y^2 + z^2}</math>. The distance between the points (x<sub>1</sub>, y<sub>1</sub>, z<sub>1</sub>) and (x<sub>2</sub>, y<sub>2</sub>, z<sub>2</sub>) is</p> $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$ <p>The unit vectors along the x-, y- and z-axes are denoted by i, j and k respectively.</p> <p>For any 3D vector <math>pi + qj + rk = \begin{pmatrix} p \\ q \\ r \end{pmatrix}</math></p> <p>To complete the questions assigned from the Textbook (pdf) in their notebook. Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.</p> <p>1. Power point presentation  2. Pure Mathematics Year 2  3. <a href="https://www.physicsandmathstutor.com/">https://www.physicsandmathstutor.com/</a>  4. <a href="https://www.drfrostmaths.com/">https://www.drfrostmaths.com/</a>  5. <a href="https://www.examsolutions.net/">https://www.examsolutions.net/</a></p>
<p><b>Lesson 3–Live Zoom lesson</b></p>	<p><b>12.3 – Solving geometric problems</b>  <b>12.4 – Application to mechanics</b></p> <p><b><u>Learning objective</u> – To use vectors to solve geometric problems and model 3D motion in mechanics with vectors.</b></p> <p><b><u>Intended Learning Outcomes</u></b></p> <p>--Students will be able to solve geometric problems involving vectors in three dimensions. If a, b and c are vectors in three dimensions which do not all lie on the same plane then you can compare their coefficients on both sides of an equation. In particular, since the vectors i, j and k are non-coplanar, if <math>pi+qj+rk = ui + vj + wk</math> then <math>p = u</math>, <math>q = v</math> and <math>r = w</math>. 3D vectors can be used to model problems in mechanics in the same way as you have previously used 2D vectors.</p> <p>To complete the questions assigned from the Textbook (pdf) in their notebook. Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.</p> <p>1. Power point presentation  2. Pure Mathematics Year 2  3. <a href="https://www.physicsandmathstutor.com/">https://www.physicsandmathstutor.com/</a>  4. <a href="https://www.drfrostmaths.com/">https://www.drfrostmaths.com/</a>  5. <a href="https://www.examsolutions.net/">https://www.examsolutions.net/</a></p>