

THE AMBASSADORS COLLEGE, OTA MATHEMATICS DEPARTMENT



SSS1 REGULAR MATHEMATICS HOLIDAY ASSIGNMENT

- (a) Construct a ΔXYZ in which $|YZ|=8.2$ cm, $\angle XYZ=60^\circ$, and $\angle XZY=72^\circ$. Measure $|XY|$.

(b) Using a ruler and compasses only, construct:

 - the locus of a point equidistant from Y and Z.
 - a point Q on this locus, equidistant from \overline{YX} and \overline{YZ} .
- If $\frac{2\sqrt{3}-\sqrt{2}}{\sqrt{3}+2\sqrt{2}} = p + q\sqrt{6}$, find the value of $(p - q)$.

SSS1 HONOURS MATHEMATICS HOLIDAY ASSIGNMENT

- State the equation of a straight line in the gradient-intercept form.
- On a Cartesian plane, plot the following points
 - $A(3, 2), B(4, 6), C(-1, 3), D(2, -7), P(5, -8), Q(-4, -2), S(-3, -2), T(1, -4)$
 - Use your knowledge of Pythagoras theorem to find the following distances:
 - $|AB|$
 - $|CD|$
 - $|PQ|$
 - $|DP|$
 - $|ST|$
 - Hence, compute the equation for the distance between two points, given that the points are (x_1, y_1) and (x_2, y_2)
- (a) With your result in number 1, state the equation with the following:

 - gradient: +3, intercept on y – axis: 2
 - gradient: –2, intercept on y – axis: 3
 - gradient: +4, intercept on y – axis: –1
 - gradient: $-\frac{7}{2}$, intercept on y – axis: –2

(b) Check your equations on www.desmos.com/calculator, observe and discuss the nature of each equation.

SSS1 REGULAR FURTHER MATH HOLIDAY ASSIGNMENT

- The first three terms of the expansion of $(1 + mx)^n$ in ascending powers of x are $1 + 14x + 84x^2$
 - Find the values of m and n .
 - By using the values of m and n obtained in (a), calculate, correct to three significant figures, the value of $(1.06)^n$.
- Express $\frac{2x - 7}{(x^2 - 1)(x + 1)}$ into partial fractions.

SSS1 HONOURS FURTHER MATH HOLIDAY ASSIGNMENT

- The function $f(x) = px^2 + qx + r$, where p, q and r are constants. If $f(1) = 0, f(-1) = 4$ and $f(2) = 7$, find the value of p, q and r .
 - Factorize $f(x)$.
- Given that $A = \begin{pmatrix} 4 & 3 & 6 \\ 1 & 8 & -4 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & 2 \\ 8 & 6 \\ 7 & 1 \end{pmatrix}$, find the product of: (a) AB (b) BA