**MERIT QUESTIONS ON A TYPICAL NCEA PAPER. (B)**

**ALGEBRA *You need to get these right for Merit level***

Question ONE

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| (a) ***Calculate x if log418 = x***  | (b)  ***Solve for x 3x = 2x + 1*** |

Question TWO

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| (a) ***Solve ( 3x)2 – 7×3x – 18 = 0*** | (b) Solve ***x2 – 9 = 5*** ***x – 3***  |

Question THREE

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| (a) ***Find p if the equation*** ***x2 + (3p + 2)x + (5p + 6) = 0 only has one root.*** | (b) ***The equation x2 + 2kx + (k + 2) = 0 has no real solutions. Find the possible k values.*** |

**CALCULUS *You need to get these right for Merit level***

Question ONE

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| (a) ***The velocity of a ball kicked vertically up is v = 20 – 10t. If the ball was kicked from an initial height of 1 metre, find the equation for its height at t sec.*** | (b) ***Find the x and y values of the maximum and minimum points on the curve*** ***y = x3 – 12x2 + 27x + 2.******(state the nature of the turning points)*** |

Question TWO

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| (a) ***Find the equation of the tangent to the curve y = x2 + 3x at the point where x = -1***  | (b) ***For what values of x is the curve y = 6x2 –x3 a decreasing function?*** |

Question THREE

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| (a) ***A model rocket starts off at ground level with an initial velocity of 1 m/s and with an*** ***acceleration of dv = 12t.***  ***dt*** ***Find the equation for the height of the rocket at t secs.***  | (b) ***Find the equation of a curve if its gradient is y ꞌ = x2 + x and it passes through the point (6, 0)***  |