## MERIT OUESTIONS ON A TYPICAL NCEA PAPER. (A)

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

Question ONE

| (a) Simplify $\frac{x^{2}-x-6}{x^{2}+x-12}$ | (b) Solve $\frac{x^{2}+3 x+2}{2 x-1}=5 x+3$ |
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|  |  |

Question TWO
(a) If $\boldsymbol{A}=\mathbf{4 0 0 \times ( 1 . 2 ) ^ { \boldsymbol { n } } \text { calculate } \boldsymbol { n } \text { if } \boldsymbol { A } \mathbf { = 9 0 0 } , ~}$
(b) Find the only valid solution to

$$
\frac{x^{2}-6 x+8}{x-4}=5
$$

Question THREE
(a) Find $k$ if the equation
(b) The equation $\boldsymbol{x}^{2}-6 x+2=\boldsymbol{k}$ has only
$3 x^{2}+(k+1) x+12=0$ only has one root. one solution. Find $k$

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

Question ONE
(a) The height of a ball kicked vertically up
(b) Find the minimum $y$ value of the curve
is $h=40 t-5 t^{2}$. Find the greatest height the
$y=3 x^{2}-12 x+5$
ball will reach.

Question TWO
(a) Find the equation of the tangent to the curve $y=x^{3}-8 x$ at the point where $x=2$
(b) For what values of $x$ is the curve $y=\frac{x^{3}}{3}-2 x^{2}-5 x$ a decreasing function?
(b)The equation of a curve is $y=x^{2}+a x+b$ and it passes through $(1,8)$.
If the gradient at $x=1$ is 6 , find $a$ and $b$.

