Student Number:

Newington College

Discover what's possible

Year 11 Mathematics Advanced

2020 Assessment 1

General Instructions

- Reading time: N/A
- Working time: 50 minutes
- Write using black or blue pen
- Attempt ALL questions
- Do NOT write in pencil
- Only board of studies calculators are to be used

TOTAL MARKS – 30

This assessment has THREE questions

Question 1	13 marks
Question 2	8 marks
Question 3	9 marks

Student Number:

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Student Number:

Question 1 (13Marks)

a) Evaluate $f(4)$ given that $f(x)=5x+2$ **1**

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b) Determine if $f(x)=x^2+6x-2$ is an even function, odd function or neither. Justify your answer. **2**

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c) Given $f(x)=3x+9$ and $g(x)=7-2x$. Find the combined function:

i. $y=f(x)+g(x)$ **1**

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ii. $y=f(x)g(x)$ **1**

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Student Number:

c) Factorise $3x^2 + 11x - 4$ **2**

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d) Simplify $\frac{12}{x} - \frac{8}{x+1}$ **2**

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e) Rationalise the denominator of $\frac{2}{\sqrt{7} - \sqrt{2}}$ **2**

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Question 1 continues overleaf

Student Number:

f) Find integers a and b such that $(5-\sqrt{11})^2 = a - b\sqrt{11}$ **2**

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End of Question 1

Student Number:

Question 2 (8 Marks)

a) Find the equation of the line that passes through the point (-2, 5) and is parallel to $5x + y + 1 = 0$ **2**

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b) What is the Domain and Range of the function $f(x) = \sqrt{9 - x^2}$? **2**

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c) Solve the equation $2^{3x-1} = \frac{1}{128}$ **2**

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d) Simplify $\left(\frac{x}{y}\right)^5 \div \left(\frac{x^{-3}}{y^2}\right)$ **2**

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End of Question 2

Student Number:

Question 3 (9 Marks)

b) An electrical store uses eight long life dome lights for 6 hours every night of the year. The purchase price of each dome light is $11.00 and they cost $**d** per hour to run.

i) Write an equation for the total cost (**$C**) of purchasing and running the eight dome lights for one year in terms of **d**. **2**

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ii) Find the value of **d** if the total running cost of these eight dome lights for a year is $61408 **1**

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iii) If the use of the dome lights reduces to 3 hours per night every night, does the total cost halve? Justify your answer with appropriate calculations **2**

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Student Number:

b) Consider the points $P(p,p^2)$, $Q\left(-\frac{1}{p},-1\right)$ and $R(a,3)$

i. Given that the gradient of $PQ = p$ and $PQ \perp RQ$. Show that $a = \frac{-(4p^2+1)}{p}$ **2**

Question 3 continues over the page

Student Number:

ii. Hence, or otherwise find the area of triangle PQR If $p = 1$ **2**

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End of Question 3
End of Assessment task