Level 4

Mathematics

Examination 2

SAMPLE

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Creator: Judy Anders Title: Level 4 Mathematics Examination 2 with detailed answers ISBN: 9781922881045 (eBook) Series: Mathematics Examinations with detailed answers for High Schools Target Audience: School age. Secondary. Subject: Mathematics Other Creators: Barbara Healy, William Paul Healy	All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form by any means whatsoever without the prior permission of the copyright owner. Apply in writing to the publishers.

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LEVEL 4

MATHEMATICS EXAMINATION 2

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Notes to Teachers

This is a Digital Publication supplied in both PDF and WORD formats with a school site licence to reproduce for students in both print and electronic formats.

- This examination is based on a syllabus containing topics for Year 10 Mathematics. Some of these topics are: (not all are necessarily included in this examination)

  working with indices, arithmetic and applications, surds, variation, similarity, circle properties, constructions and transformations, properties of 2D shapes, perimeter and area, surface area and volume, trigonometry, applications of trigonometry, expansion, factorisation and indices, linear functions, quadratic functions, transposition, substitution and fractions, probability, analysing data, cumulative frequency curves, bivariate data.

- Teachers should examine the questions to judge if they are suitable for their classes

- This is a 1.5 hour examination (total = 80 marks)

- The examination can be shortened if required by removing some of the questions

- A set of detailed answers with a marking scheme is supplied with this examination

- A multiple-choice answer sheet is supplied with this examination

- While every effort has been made to ensure the correctness of each question and answer, there is no guarantee of perfection. Please advise of you believe you have found an error.

Examination 2

LEVEL 4 MATHEMATICS

Reading time: 15 minutes
Total writing time: 1.5 hours

QUESTION AND ANSWER BOOK

Structure of book

Section	Number of questions	Number of questions to be answered	Number of Marks
A	10	10	10
B	12	12	70

Directions to students

Materials
Question and answer book of 21 pages.
Working space is provided throughout the book.
You may use an approved calculator, ruler, protractor, set square and aids for curve sketching.

The Examination.
Ensure that you write your **name** in the space provided on the cover of this book.
Answer **all** questions.
There is a total of 80 marks available for the examination.
The marks for each part of each question are shown.
Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.
Angles in all diagrams are measured in degrees.
All written responses should be in English.

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SECTION A consists of ten multiple choice questions. Write the letter which corresponds to your answer in the box at the right of each question. Each question is worth 2 marks.
Show your working in the space provided. Marks will not be deducted for incorrect answers.

Question 1

$9^{-\frac{1}{2}}$ equals

A. $-\dfrac{1}{3}$

B. $- 81$

C. $\dfrac{1}{3}$

D. 3

E. 81

Question 2

$\sqrt{32} + \sqrt{8} - 3\sqrt{12}$ equals

A. $3(\sqrt{2} - \sqrt{3})$

B. $6(\sqrt{2} - \sqrt{3})$

C. $2(3\sqrt{2} - 2\sqrt{3})$

D. $3(2\sqrt{2} - \sqrt{3})$

E. $\sqrt{52}$

Question 1(4 marks)

a.   Crunchie Munchies cost \$7.10 for a 375 g packet. These packets will be on sale tomorrow at

$12\dfrac{1}{2}\%$ discount. What will the sale price be for a 375 g packet?

....

....

....

(2 marks)

b.   A 725 g packet of Crunchie Munchies sells for \$11.90. Which is the better value and by how
much per gram – the 725 g packet or the discounted 375 g packet?

....

....

....

(2 marks)

LEVEL 4 MATHEMATICS

EXAMINATION 2

ANSWER SHEET

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NAME _____

INSTRUCTIONS

- Write your name in the space provided above.

- Marks will **NOT** be deducted for incorrect answers.

- **NO MARK** will be given if more than **ONE** answer is completed for any question.

- All answers must be completed like **THIS** example.

A	B	C	D	E

SECTION A

1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E

1.   **Answer C**

$$9^{-\frac{1}{2}} = \frac{1}{9^{\frac{1}{2}}} = \frac{1}{\sqrt{9}} = \frac{1}{3}$$

2.   **Answer B**

$$\sqrt{32} + \sqrt{8} - 3\sqrt{12}$$
$$= \sqrt{16 \times 2} + \sqrt{4 \times 2} - 3\sqrt{4 \times 3}$$
$$= 4\sqrt{2} + 2\sqrt{2} - 6\sqrt{3}$$
$$= 6(\sqrt{2} - \sqrt{3})$$

3.   **Answer B**

This graph has $y = 0$ at $x = -2$, $x = 1$ and $x = 3$
There is a positive slope at the beginning.
Therefore, no negative sign at the front of the factors.
Therefore, $y = (x-1)(x+2)(x-3)$

4.   **Answer B**

Probability of winning the first and second games = $\dfrac{3}{7} \times \dfrac{2}{7} = \dfrac{6}{49}$

5.   **Answer A**

Reflected in the X axis $y = -x^2$
Translated 3 units to the right $y = -(x-3)^2$
Translated 4 units up $y = -(x-3)^2 + 4$

6.   **Answer C**

$$E = mc^2$$
$$\Rightarrow \frac{E}{m} = c^2$$
$$\Rightarrow c = \sqrt{\frac{E}{m}}$$
$$\Rightarrow c = \sqrt{\frac{E}{m}} \times \frac{\sqrt{m}}{\sqrt{m}}$$
$$\Rightarrow c = \frac{\sqrt{Em}}{m}$$

Question 1

a.

$12\frac{1}{2}\%\,\text{of}\,\$7.10$

$=\frac{1}{8}\times 7.10=89\,\text{cents [1 mark]}$

$\text{Sale price}=\$7.10-0.89$

$=\$6.21\,[1\,\text{mark}]$

b. Sale price per gram

$=\frac{6.21}{375}=1.7\,\text{cents}$

Price per gram for 725g packet

$=\frac{11.90}{725}=1.6\,\text{cents}$

The 725 g packet is cheaper [1 mark]
by 0.1 cents per gram. [1 mark]

Question 2

a. $y=0\,\text{or}\,y-3=0$

$y=0\,\text{or}\,y=3\,[1\,\text{mark}]$

b.

$y^2+y=6$

$\Rightarrow y^2+y-6=0$

$\Rightarrow (y+3)(y-2)=0\,[1\,\text{mark}]$

$\Rightarrow y=-3\,\text{or}\,2\,[1\,\text{mark}]$

c.

$\frac{y}{2}-\frac{5y}{3}>21$

$\Rightarrow \frac{3y-10y}{6}>21\,[1\,\text{mark}]$

$\Rightarrow 3y-10y>126$

$\Rightarrow -7y>126\,[1\,\text{mark}]$

$\Rightarrow 7y<-126$

$\Rightarrow y<-18\,[1\,\text{mark}]$

Question 3

a.

$m=\frac{y_2-y_1}{x_2-x_1}$

$=\frac{-3-0}{2-(-1)}\,[1\,\text{mark}]$

$=\frac{-3}{2+1}$

$=\frac{-3}{3}$

$=-1\,[1\,\text{mark}]$

b. Equation of the line is
$y=mx+c$

Now, $m=-1$

$\Rightarrow y=-x+c$

When $x=-1,\,y=0$

$\Rightarrow 0=(-1\times-1)+c=1+c$

$\Rightarrow c=-1$

$\Rightarrow y=-x-1\,[1\,\text{mark}]$

c. Substituting

$y=-x-1\,\text{into}\,y=x^2-2x-3\,[1\,\text{mark}]$

$\Rightarrow -x-1=x^2-2x-3$

$\Rightarrow x^2-x-2=0\,[1\,\text{mark}]$

$\Rightarrow (x-2)(x+1)=0$

$\Rightarrow x=2\,\text{or}\,x=-1$

When $x=2,\,y=-2-1=-3$

When $x=-1,\,y=1-1=0$

Points are $(2,-3)$ and $(-1,0)\,[1\,\text{mark}]$

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