Neap

HSC Trial Examination 2020

Mathematics Extension 1

General Instructions

- Reading time – 5 minutes
- Working time – 2 hours
- Write using black pen
- NESA approved calculators may be used
- A reference sheet is provided at the back of this paper
- In Questions 11–14, show relevant mathematical reasoning and/or calculations

Total marks: 70

Section I – 10 marks (pages 2–5)

- Attempt Questions 1–10
- Allow about 15 minutes for this section

Section II – 60 marks (pages 6–12)

- Attempt Questions 11–14
- Allow about 1 hour and 45 minutes for this section

Students are advised that this is a trial examination only and cannot in any way guarantee the content or the format of the 2020 HSC Mathematics Extension 1 Examination.

Section I

10 marks
Attempt Questions 1–10
Allow about 15 minutes for this section

Use the multiple-choice answer sheet for Questions 1–10.

1. Let $P(x) = x^2 + bx + c$ where b and c are constants. The zeros of $P(x)$ are α and $\alpha + 1$.

What are the correct expressions for b and c in terms of α?

(A) $b = -(2\alpha + 1)$ and $c = \alpha^2 + \alpha$

(B) $b = 2\alpha + 1$ and $c = \alpha^2 + \alpha$

(C) $b = \alpha^2 + \alpha$ and $c = -(2\alpha + 1)$

(D) $b = \alpha^2 + \alpha$ and $c = 2\alpha + 1$

2. What is the derivative of $\tan^{-1}(2x - 1)$?

(A) $\dfrac{1}{4x^2 - 4x + 2}$

(B) $\dfrac{2x - 1}{2x^2 - 2x + 1}$

(C) $\dfrac{2}{2x^2 - 2x + 1}$

(D) $\dfrac{1}{2x^2 - 2x + 1}$

3. An experiment consisted of tossing a biased coin three times and recording the number of tails obtained. This experiment was repeated 1000 times and the results are shown in the table.

Number of tails	*Frequency*
0	219
1	427
2	292
3	62

Based on these results, what is the probability that the coin shows tails when tossed?

(A) 0.3
(B) 0.4
(C) 0.5
(D) 0.6

4. Which of the following expressions is equal to $\cos(x) + \sin(x)$?

(A) $\sqrt{2}\sin\left(x + \frac{\pi}{4}\right)$

(B) $2\sin\left(x + \frac{\pi}{4}\right)$

(C) $\sqrt{2}\sin\left(x - \frac{\pi}{4}\right)$

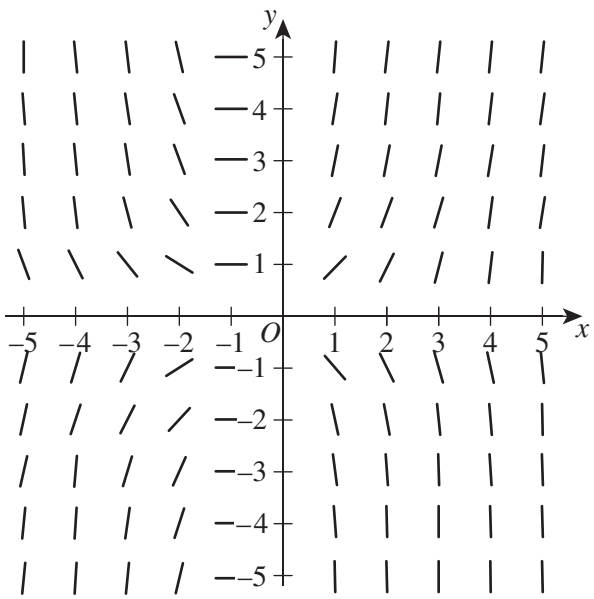
(D) $2\sin\left(x - \frac{\pi}{4}\right)$

5. Four males and four females are to sit around a table.

In how many ways can this be done if the males and females alternate?

(A) 144
(B) 2880
(C) 5040
(D) 40 320

6. The direction (slope) field for a first order differential equation is shown.



Which of the following could be the differential equation represented?

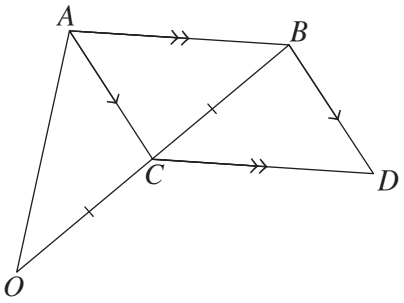
(A) $\frac{dy}{dx} = (x+1)^3$

(B) $\frac{dy}{dx} = x(y+1)$

(C) $\frac{dy}{dx} = (x+1)y$

(D) $\frac{dy}{dx} = (x-1)y$

7. The position vectors of points A and B are $\underset{\sim}{a}$ and $\underset{\sim}{b}$ respectively. Point C is the midpoint of OB and point D is such that $ABDC$ is a parallelogram.



Which of the following is the position vector of D?

(A) $\frac{3}{2}\underset{\sim}{b} + \underset{\sim}{a}$

(B) $\frac{3}{2}\underset{\sim}{b} - \underset{\sim}{a}$

(C) $\frac{1}{2}\underset{\sim}{b} - \frac{1}{2}\underset{\sim}{a}$

(D) $\frac{1}{2}\underset{\sim}{b} - \underset{\sim}{a}$

8. Which of the following functions is a primitive of $\frac{1}{\sqrt{4-9x^2}}$?

(A) $\frac{1}{3}\sin^{-1}\frac{2x}{3}$

(B) $\frac{1}{9}\sin^{-1}\frac{3x}{2}$

(C) $\frac{1}{9}\sin^{-1}\frac{2x}{3}$

(D) $\frac{1}{3}\sin^{-1}\frac{3x}{2}$

9. A curve C has parametric equations $x = \cos^2 t$ and $y = 4\sin^2 t$ for $t \in R$.

What is the Cartesian equation of C?

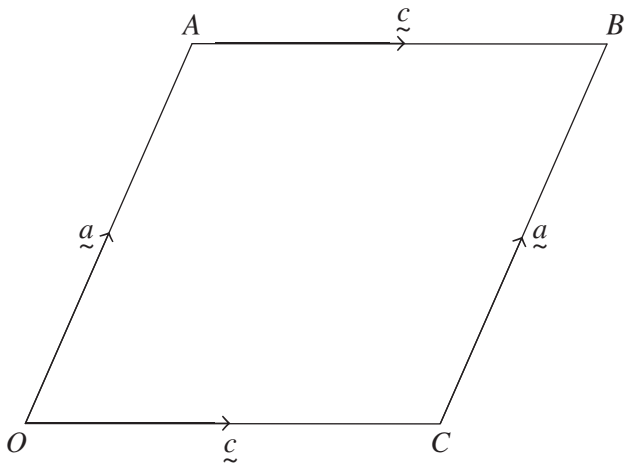
(A) $y = 1 - x$ for $0 \le x \le 1$

(B) $y = 4 - 4x$ for $x \in R$

(C) $y = 4 - 4x$ for $0 \le x \le 1$

(D) $y = 1 - x$ for $x \in R$

10. The diagram shows $OABC$, a rhombus in which $\overrightarrow{OA} = \overrightarrow{CB} = \underset{\sim}{a}$ and $\overrightarrow{OC} = \overrightarrow{AB} = \underset{\sim}{c}$.



To prove that the diagonals of $OABC$ are perpendicular, it is required to show that

(A) $(\underset{\sim}{a} + \underset{\sim}{c}) \cdot (\underset{\sim}{a} + \underset{\sim}{c}) = 0.$

(B) $(\underset{\sim}{a} - \underset{\sim}{c}) \cdot (\underset{\sim}{a} - \underset{\sim}{c}) = 0.$

(C) $(\underset{\sim}{a} - \underset{\sim}{c}) \cdot (\underset{\sim}{a} + \underset{\sim}{c}) = 0.$

(D) $\underset{\sim}{a} \cdot \underset{\sim}{c} = 0.$

Section II

60 marks
Attempt Questions 11–14
Allow about 1 hour and 45 minutes for this section

Answer each question in a SEPARATE writing booklet. Extra writing booklets are available.

In Questions 11–14, your responses should include relevant mathematical reasoning and/or calculations.

Question 11 (15 marks) Use a SEPARATE writing booklet.

(a) Consider the function $f(x) = x^2 - 4x + 6$.

(i) Explain why the domain of $f(x)$ must be restricted if $f(x)$ is to have an inverse function. **1**

(ii) Given that the domain of $f(x)$ is restricted to $x \le 2$, find an expression for $f^{-1}(x)$. **2**

(iii) Given the restriction in part (a) (ii), state the domain and range of $f^{-1}(x)$. **2**

(iv) The curve $y = f(x)$ with its restricted domain and the curve $y = f^{-1}(x)$ intersect at the point P. **2**

Find the coordinates of P.

(b) Use the substitution $u = 1 + 2\tan x$ to evaluate $\displaystyle\int_0^{\frac{\pi}{4}} \frac{1}{(1+2\tan x)^2 \cos^2 x}\,dx$. **2**

(c) Use t-formulae to solve the equation $\cos x - \sin x = 1$, where $0 \le x \le 2\pi$. **3**

(d) The work done, W, by a constant force, $\underset{\sim}{F}$, in moving a particle through a displacement, $\underset{\sim}{s}$, is defined by the formula $W = \underset{\sim}{F} \cdot \underset{\sim}{s}$. A force described by the vector $\underset{\sim}{F} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$ moves a particle along the line l from $P(-1, 2)$ to $Q(2, -2)$.

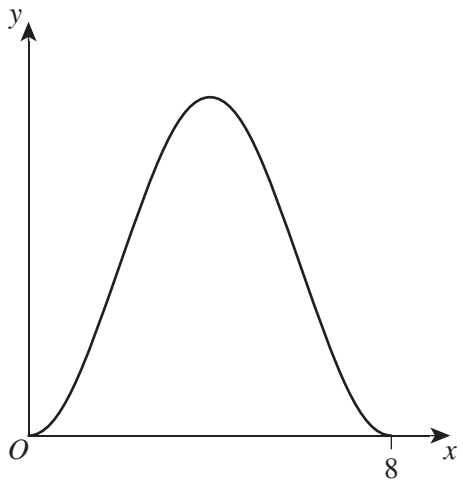
(i) Find $\underset{\sim}{s} = \overrightarrow{PQ}$ and hence find the value of W. **1**

(ii) Hence, verify that W is also given by $W = (\underset{\sim}{F} \cdot \hat{\underset{\sim}{s}})|\underset{\sim}{s}|$. **1**

(iii) Find the component of $\underset{\sim}{F}$ in the direction of l. **1**

Question 12 (15 marks) Use a SEPARATE writing booklet.

(a) A proposed plan for a garden is shown in the diagram. The curved boundary of the garden is modelled by the function $f(x) = 6\sin^2\left(\frac{\pi x}{8}\right)$, $0 \le x \le 8$.



(i) Use the identity $\sin A \sin B = \frac{1}{2}[\cos(A - B) - \cos(A + B)]$ to show that $\sin^2\left(\frac{\pi x}{8}\right) = \frac{1}{2}\left(1 - \cos\frac{\pi x}{4}\right)$. **2**

(ii) Use the result from part (a) (i) to find the area, A, of the garden. **2**

Question 12 continues on page 8

Question 12 (continued)

(b) A state-wide housing study found that 36% of adults in NSW have a mortgage.

(i) A random sample of 25 adults in NSW is to be taken to determine the proportion of those who have a mortgage. **2**

Show that the mean and standard deviation for the distribution of sample proportions of such random samples are 0.36 and 0.096 respectively.

(ii) Part of a table of $P(Z \leq z)$ values, where Z is a standard normal variable, is shown. **2**

z	*+0.00*	*+0.01*	*+0.02*	*+0.03*	*+0.04*	*+0.05*	*+0.06*	*+0.07*	*+0.08*	*+0.09*
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964

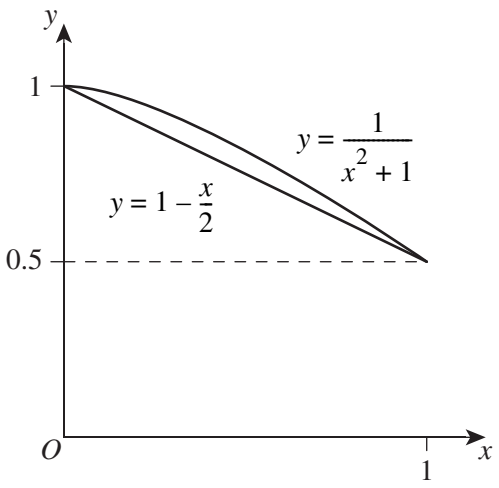
Of a random sample of 25 adults in NSW, use the table to estimate the probability that at most three will have a mortgage. Give your answer correct to four decimal places.

(iii) If a random sample of 25 adults in NSW is taken, find the probability that the sample proportion is equal to the population proportion. Give your answer correct to four decimal places. **2**

Question 12 continues on page 9

Question 12 (continued)

(c) The diagram shows the graph of $y = \dfrac{1}{x^2 + 1}$ and the graph of $y = 1 - \dfrac{x}{2}$ for $0 \le x \le 1$.



(i) Find the exact volume of the solid of revolution formed when the region bounded by the graph of $y = \dfrac{1}{x^2 + 1}$, the y-axis and the line $y = \dfrac{1}{2}$ is rotated 360° about the y-axis. **2**

(ii) Find the exact volume of the solid of revolution formed when the region bounded by the graph of $y = 1 - \dfrac{x}{2}$, the y-axis and the line $y = \dfrac{1}{2}$ is rotated 360° about the y-axis. **2**

(iii) Use the results from parts (c) (i) and (ii) to show that $\ln 2 > \dfrac{2}{3}$. **1**

End of Question 12

Question 13 (15 marks) Use a SEPARATE writing booklet.

(a) A particle is projected from a point O on level horizontal ground with a speed of 21 m s^{-1} at an angle θ to the horizontal. At time T seconds, the particle passes through the point $B(12, 2)$.

Neglecting the effects of air resistance, the equations describing the motion of the particle are:

$$x = Vt\cos\theta$$

$$y = Vt\sin\theta - \frac{1}{2}gt^2$$

where t is the time in seconds after projection, g m s^{-2} is the acceleration due to gravity where $g = 9.8$ m s^{-2} and x and y are measured in metres. Do NOT prove these equations.

(i) By considering the horizontal component of the particle's motion, show that $T = \frac{4}{7}\sec\theta$. **1**

(ii) By considering the vertical component of the particle's motion and, using the result from part (a) (i), show that $4\tan^2\theta - 30\tan\theta + 9 = 0$. **2**

(iii) Find the particle's least possible flight time from O to B. Give your answer correct to two decimal places. **2**

(b) Prove by mathematical induction that, for all integers $n \geq 1$, **3**

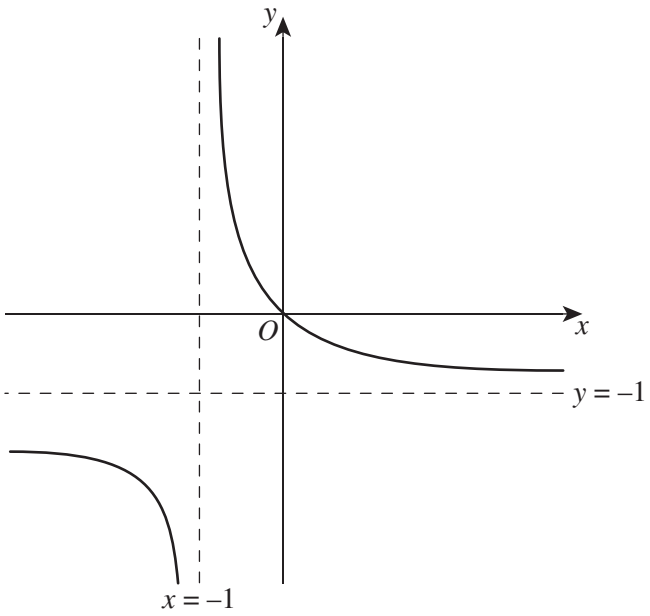
$$\frac{2}{1\times 3} + \frac{2}{2\times 4} + \frac{2}{3\times 5} + \ldots + \frac{2}{n(n+2)} = \frac{3}{2} - \frac{2n+3}{(n+1)(n+2)}.$$

(c) (i) Prove the trigonometric identity $\tan 3\theta = \dfrac{3\tan\theta - \tan^3\theta}{1 - 3\tan^2\theta}$. **3**

(ii) Use the identity from part (c) (i) to find the roots of the cubic equation $x^3 - 3x^2 - 3x + 1 = 0$ and hence find the exact value of $\tan\frac{\pi}{12}$. **4**

Question 14 (15 marks) Use a SEPARATE writing booklet.

(a) The diagram below is a sketch of the graph of the function $f(x) = -\dfrac{x}{x+1}$.



(i) Sketch the graph of $y = (f(x))^2$, showing all asymptotes and intercepts. **2**

(ii) Sketch the graph of $y = x + f(x)$, showing all asymptotes and intercepts. **2**

(iii) Solve the equation $(f(x))^2 = f(x)$. **1**

Question 14 continues on page 12

Question 14 (continued)

(b) The area A cm^2 is occupied by a bacterial colony. The colony has its growth modelled by the logistic equation $\frac{dA}{dt} = \frac{1}{25}A(50 - A)$ where $t \geq 0$ and t is measured in days. At time $t = 0$, the area occupied by the bacteria colony is $\frac{1}{2}$ cm^2.

(i) Show that $\frac{1}{A(50-A)} = \frac{1}{50}\left(\frac{1}{A} + \frac{1}{50-A}\right)$. **1**

(ii) Using the result from part (b) (i), solve the logistic equation and hence show that $A = \frac{50}{1 + 99e^{-2t}}$. **3**

(iii) According to this model, what is the limiting area of the bacteria colony? **1**

(iv) Find the exact time when the rate of change in the area occupied by the bacterial colony is at its maximum. **2**

(c) The table shows selected values of a one-to-one differentiable function $g(x)$ and its derivative $g'(x)$. **3**

x	-1	0
$g(x)$	-5	-1
$g'(x)$	3	$\frac{1}{2}$

Let $f(x)$ be a function such that $f(x) = g^{-1}(x)$.

Find the value of $f'(-1)$.

End of paper

Mathematics Advanced
Mathematics Extension 1
Mathematics Extension 2

REFERENCE SHEET

Measurement

Length

$$l = \frac{\theta}{360} \times 2\pi r$$

Area

$$A = \frac{\theta}{360} \times \pi r^2$$

$$A = \frac{h}{2}(a + b)$$

Surface area

$$A = 2\pi r^2 + 2\pi rh$$

$$A = 4\pi r^2$$

Volume

$$V = \frac{1}{3}Ah$$

$$V = \frac{4}{3}\pi r^3$$

Financial Mathematics

$$A = P(1 + r)^n$$

Sequences and series

$$T_n = a + (n - 1)d$$

$$S_n = \frac{n}{2}[2a + (n - 1)d] = \frac{n}{2}(a + l)$$

$$T_n = ar^{n-1}$$

$$S_n = \frac{a(1 - r^n)}{1 - r} = \frac{a(r^n - 1)}{r - 1}, \; r \neq 1$$

$$S = \frac{a}{1 - r}, \; |r| < 1$$

Functions

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For $ax^3 + bx^2 + cx + d = 0$:

$$\alpha + \beta + \gamma = -\frac{b}{a}$$

$$\alpha\beta + \alpha\gamma + \beta\gamma = \frac{c}{a}$$

$$\text{and } \alpha\beta\gamma = -\frac{d}{a}$$

Relations

$$(x - h)^2 + (y - k)^2 = r^2$$

Logarithmic and Exponential Functions

$$\log_a a^x = x = a^{\log_a x}$$

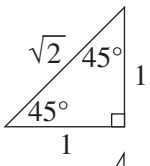
$$\log_a x = \frac{\log_b x}{\log_b a}$$

$$a^x = e^{x \ln a}$$

Trigonometric Functions

$$\sin A = \frac{\text{opp}}{\text{hyp}}, \quad \cos A = \frac{\text{adj}}{\text{hyp}}, \quad \tan A = \frac{\text{opp}}{\text{adj}}$$

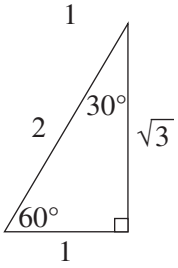
$$A = \frac{1}{2}ab\sin C$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$



$$l = r\theta$$

$$A = \frac{1}{2}r^2\theta$$

Trigonometric identities

$$\sec A = \frac{1}{\cos A}, \cos A \neq 0$$

$$\text{cosec} A = \frac{1}{\sin A}, \sin A \neq 0$$

$$\cot A = \frac{\cos A}{\sin A}, \sin A \neq 0$$

$$\cos^2 x + \sin^2 x = 1$$

Compound angles

$$\sin(A + B) = \sin A\cos B + \cos A\sin B$$

$$\cos(A + B) = \cos A\cos B - \sin A\sin B$$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A\tan B}$$

If $t = \tan\frac{A}{2}$ then $\sin A = \frac{2t}{1 + t^2}$

$$\cos A = \frac{1 - t^2}{1 + t^2}$$

$$\tan A = \frac{2t}{1 - t^2}$$

$$\cos A\cos B = \frac{1}{2}[\cos(A - B) + \cos(A + B)]$$

$$\sin A\sin B = \frac{1}{2}[\cos(A - B) - \cos(A + B)]$$

$$\sin A\cos B = \frac{1}{2}[\sin(A + B) + \sin(A - B)]$$

$$\cos A\sin B = \frac{1}{2}[\sin(A + B) - \sin(A - B)]$$

$$\sin^2 nx = \frac{1}{2}(1 - \cos 2nx)$$

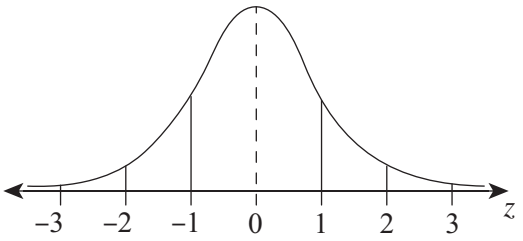
$$\cos^2 nx = \frac{1}{2}(1 + \cos 2nx)$$

Statistical Analysis

$$z = \frac{x - \mu}{\sigma}$$

An outlier is a score
less than $Q_1 - 1.5 \times IQR$
or
more than $Q_3 + 1.5 \times IQR$

Normal distribution



- approximately 68% of scores have z-scores between –1 and 1
- approximately 95% of scores have z-scores between –2 and 2
- approximately 99.7% of scores have z-scores between –3 and 3

$$E(X) = \mu$$

$$\text{Var}(X) = E[(X - \mu)^2] = E(X^2) - \mu^2$$

Probability

$$P(A \cap B) = P(A)P(B)$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}, P(B) \neq 0$$

Continuous random variables

$$P(X \leq r) = \int_a^r f(x)dx$$

$$P(a < X < b) = \int_a^b f(x)dx$$

Binomial distribution

$$P(X = r) = {}^nC_r p^r (1 - p)^{n - r}$$

$X \sim \text{Bin}(n, p)$
$\Rightarrow P(X = x)$

$$= \binom{n}{x} p^x (1 - p)^{n - x}, x = 0, 1, \ldots, n$$

$$E(X) = np$$

$$\text{Var}(X) = np(1 - p)$$

Differential Calculus

Function	Derivative
$y = f(x)^n$	$\frac{dy}{dx} = nf'(x)[f(x)]^{n-1}$
$y = uv$	$\frac{dy}{dx} = u\frac{dv}{dx} + v\frac{du}{dx}$
$y = g(u)$ where $u = f(x)$	$\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$
$y = \frac{u}{v}$	$\frac{dy}{dx} = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$
$y = \sin f(x)$	$\frac{dy}{dx} = f'(x)\cos f(x)$
$y = \cos f(x)$	$\frac{dy}{dx} = -f'(x)\sin f(x)$
$y = \tan f(x)$	$\frac{dy}{dx} = f'(x)\sec^2 f(x)$
$y = e^{f(x)}$	$\frac{dy}{dx} = f'(x)e^{f(x)}$
$y = \ln f(x)$	$\frac{dy}{dx} = \frac{f'(x)}{f(x)}$
$y = a^{f(x)}$	$\frac{dy}{dx} = (\ln a)f'(x)a^{f(x)}$
$y = \log_a f(x)$	$\frac{dy}{dx} = \frac{f'(x)}{(\ln a)f(x)}$
$y = \sin^{-1} f(x)$	$\frac{dy}{dx} = \frac{f'(x)}{\sqrt{1-[f(x)]^2}}$
$y = \cos^{-1} f(x)$	$\frac{dy}{dx} = -\frac{f'(x)}{\sqrt{1-[f(x)]^2}}$
$y = \tan^{-1} f(x)$	$\frac{dy}{dx} = \frac{f'(x)}{1+[f(x)]^2}$

Integral Calculus

$$\int f'(x)[f(x)]^n dx = \frac{1}{n+1}[f(x)]^{n+1} + c$$

where $n \neq -1$

$$\int f'(x)\sin f(x)dx = -\cos f(x) + c$$

$$\int f'(x)\cos f(x)dx = \sin f(x) + c$$

$$\int f'(x)\sec^2 f(x)dx = \tan f(x) + c$$

$$\int f'(x)e^{f(x)}dx = e^{f(x)} + c$$

$$\int \frac{f'(x)}{f(x)}dx = \ln|f(x)| + c$$

$$\int f'(x)a^{f(x)}dx = \frac{a^{f(x)}}{\ln a} + c$$

$$\int \frac{f'(x)}{\sqrt{a^2-[f(x)]^2}}dx = \sin^{-1}\frac{f(x)}{a} + c$$

$$\int \frac{f'(x)}{a^2+[f(x)]^2}dx = \frac{1}{a}\tan^{-1}\frac{f(x)}{a} + c$$

$$\int u\frac{dv}{dx}dx = uv - \int v\frac{du}{dx}dx$$

$$\int_a^b f(x)dx$$

$$\approx \frac{b-a}{2n}\{f(a)+f(b)+2[f(x_1)+\ldots+f(x_{n-1})]\}$$

where $a = x_0$ and $b = x_n$

Combinatorics

$${}^{n}P_{r} = \frac{n!}{(n-r)!}$$

$$\binom{n}{r} = {}^{n}C_{r} = \frac{n!}{r!(n-r)!}$$

$$(x+a)^{n} = x^{n} + \binom{n}{1}x^{n-1}a + \ldots + \binom{n}{r}x^{n-r}a^{r} + \ldots + a^{n}$$

Vectors

$$|\underset{\sim}{u}| = |x\underset{\sim}{i} + y\underset{\sim}{j}| = \sqrt{x^{2} + y^{2}}$$

$$\underset{\sim}{u} \cdot \underset{\sim}{v} = |\underset{\sim}{u}||\underset{\sim}{v}|\cos\theta = x_{1}x_{2} + y_{1}y_{2},$$

where $\underset{\sim}{u} = x_{1}\underset{\sim}{i} + y_{1}\underset{\sim}{j}$

and $\underset{\sim}{v} = x_{2}\underset{\sim}{i} + y_{2}\underset{\sim}{j}$

$$\underset{\sim}{r} = \underset{\sim}{a} + \lambda\underset{\sim}{b}$$

Complex Numbers

$$z = a + ib = r(\cos\theta + i\sin\theta)$$
$$= re^{i\theta}$$

$$[r(\cos\theta + i\sin\theta)]^{n} = r^{n}(\cos n\theta + i\sin n\theta)$$
$$= r^{n}e^{in\theta}$$

Mechanics

$$\frac{d^{2}x}{dt^{2}} = \frac{dv}{dt} = v\frac{dv}{dx} = \frac{d}{dx}\left(\frac{1}{2}v^{2}\right)$$

$$x = a\cos(nt + \alpha) + c$$

$$x = a\sin(nt + \alpha) + c$$

$$\ddot{x} = -n^{2}(x - c)$$

Neap

HSC Trial Examination 2020

Mathematics Extension 1

Question Number

Section II – Writing Booklet

Student Name/Number: _____

Instructions

Use a separate writing booklet for each question in Section II.

Write the number of this booklet and the total number of booklets that you have used for this question (e.g. 1 of 3) ⇒ [ ] of [ ]

this booklet

number of booklets for this question

Write in black or blue pen (black is recommended).

You may ask for an extra writing booklet if you need more space.

If you have not attempted the question(s), you must still hand in a writing booklet, with 'NOT ATTEMPTED' written clearly on the front cover

You may NOT take any writing booklets, used or unused, from the examination room.

Tick this box if you have continued this answer in another writing booklet. ☐

Neap

HSC Trial Examination 2020

Mathematics Extension 1

DIRECTIONS:

Write your name in the space provided.

Write your student number in the boxes provided below. Then, in the columns of digits below each box, fill in the oval which has the same number as you have written in the box. Fill in **one** oval only in each column.

Read each question and its suggested answers. Select the alternative A, B, C, or D that best answers the question. Fill in the response oval completely, using blue or black pen. Mark **only one** oval per question.

A ⬭ B ⬬ C ⬭ D ⬭

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A ⬬ B ⬭ C ⬭ D ⬭

If you change your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word *correct* and draw an arrow as follows.

correct

A ⬭ B ⬭ C ⬭ D ⬭

STUDENT NAME: _____

STUDENT NUMBER:

1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9
0	0	0	0	0	0	0	0	0

SECTION I
MULTIPLE-CHOICE MULTIPLE-CHOICE ANSWER SHEET

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

STUDENTS SHOULD NOW CONTINUE WITH SECTION II