VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2001

MATHEMATICAL METHODS

Written examination 1
(Facts, skills and applications)

Friday 9 November 2001

Reading time: 9.00 am to 9.15 am (15 minutes)
Writing time: 9.15 am to 10.45 am (1 hour 30 minutes)

PART I

MULTIPLE-CHOICE QUESTION BOOK

Directions to students

This examination has two parts: Part I (multiple-choice questions) and Part II (short-answer questions).
Part I consists of this question book and must be answered on the answer sheet provided for multiple-choice questions.
Part II consists of a separate question and answer book.
You must complete **both** parts in the time allotted. When you have completed one part continue immediately to the other part.
A detachable formula sheet for use in both parts is in the centrefold of this book.

At the end of the examination
Place the answer sheet for multiple-choice questions (Part I) inside the front cover of the question and answer book (Part II).
You may keep this question book.

Structure of book

Number of questions	*Number of questions to be answered*	*Number of marks*
27	27	27

Materials
- Question book of 15 pages with a detachable sheet of miscellaneous formulas in the centrefold and one blank page for rough working.
- Answer sheet for multiple-choice questions.
- Up to four pages (two A4 sheets) of pre-written notes (typed or handwritten).
- An approved scientific and/or graphics calculator, ruler, protractor, set-square and aids for curve-sketching.
- At least one pencil and an eraser.

Instructions
- Detach the formula sheet from the centre of this book during reading time.
- Check that your **name** and **student number** as printed on your answer sheet for multiple-choice questions are correct, **and** sign your name in the space provided to verify this.
- Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

At the end of the examination
- Place the answer sheet for multiple-choice questions (Part I) inside the front cover of the question and answer book (Part II).
- You may keep this question book.

Instructions for Part I

Answer **all** questions on the answer sheet provided for multiple-choice questions. A correct answer scores 1, an incorrect answer scores 0.

Marks will not be deducted for incorrect answers. You should attempt every question.

No mark will be given if more than one answer is completed for any question.

Question 1

The function $f: [0, 2\pi] \to R$, $f(x) = 3\sin\left(2x - \frac{\pi}{2}\right)$ has range

A. R

B. [0, 3]

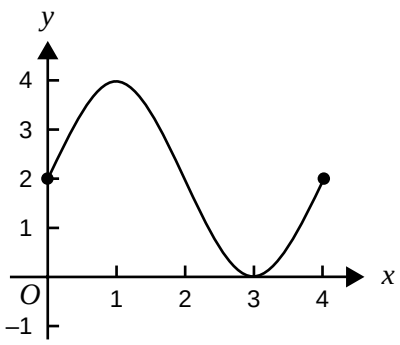
C. [0, 6]

D. [–3, 0]

E. [–3, 3]

Question 2

The diagram below shows one cycle of the graph of a circular function.



A possible equation for the function whose graph is shown is

A. $y = 4 \sin(2x) + 2$

B. $y = 2 \sin(2\pi x) + 2$

C. $y = 2 \sin\left(\frac{\pi}{2} x\right) + 2$

D. $y = 4 \sin\left(\frac{1}{2} x\right) + 2$

E. $y = 2 \sin(8\pi x) + 2$

Question 3

One cycle of the graph of the function with equation $y = \tan(ax)$ has vertical asymptotes at $x = \frac{3\pi}{4}$ and $x = \frac{5\pi}{4}$.

A possible value for a is

A. $\frac{\pi}{2}$

B. 2

C. 2π

D. 4

E. 4π

Question 4

The fifth and sixth rows of Pascal's triangle are shown.

			1		4		6		4		1	
1		5		10		10		5		1	

The coefficient of x^2 in the expansion of $(x - 2)^5$ is

A. 10×2^3

B. 6×2^3

C. -6×2^3

D. 10×2^2

E. -10×2^3

Question 5

$\log_e(3e^{5x})$ is equal to

A. $15x$

B. $\log_e(15) + x$

C. $\log_e(e^{15x})$

D. $5x \log_e(3)$

E. $\log_e(3) + 5x$

Question 6

If $2\log_a(x) = \log_a(16) + 4$, then x is equal to

A. $4a^2$

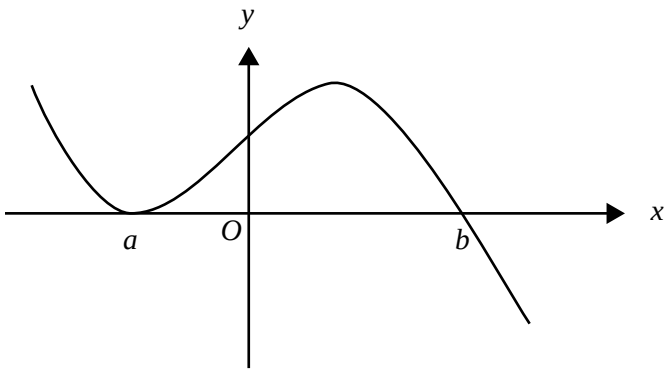
B. $\pm 4a^2$

C. $\sqrt{20}$

D. $\sqrt{8}$

E. $3\frac{2}{3}$

Question 7



The graph shown could be that of a function f whose rule is

A. $f(x) = (x - a)^2 (b - x)$

B. $f(x) = (x - b)^2 (a - x)$

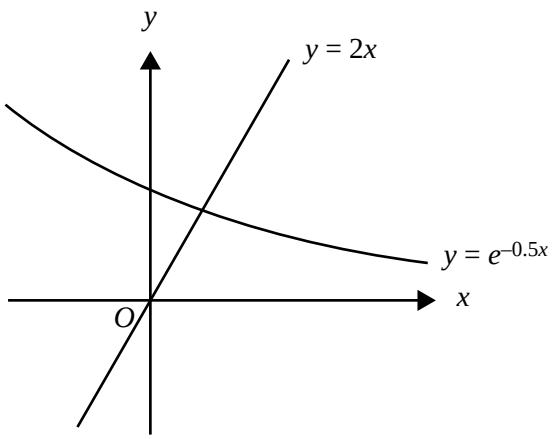
C. $f(x) = -(x + a)^2 (x + b)$

D. $f(x) = (x - a)^2 (x - b)$

E. $f(x) = (x + a)^2 (x - b)$

Question 8

Part of the graphs of the functions with equations $y = 2x$ and $y = e^{-0.5x}$ are shown below.



The solution of the equation $2x = e^{-0.5x}$ is closest to

A. 0.40

B. 0.41

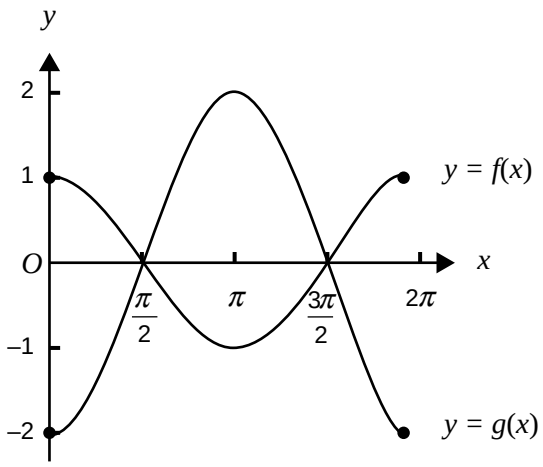
C. 0.42

D. 0.81

E. 0.82

Question 9

The diagram below shows the graphs of two circular functions, f and g.



The graph of the function with equation $y = f(x)$ is transformed into the graph of the function with equation $y = g(x)$ by

A. a dilation by a scale factor of $\frac{1}{2}$ from the y-axis and a reflection in the x-axis.

B. a dilation by a scale factor of $\frac{1}{2}$ from the x-axis and a reflection in the x-axis.

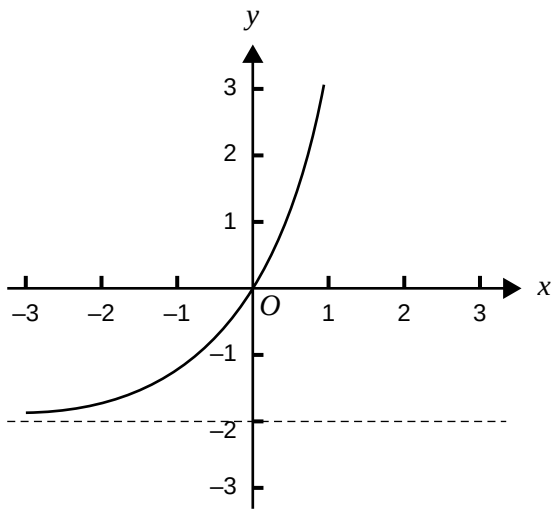
C. a dilation by a scale factor of 2 from the x-axis and a reflection in the x-axis.

D. a dilation by a scale factor of 2 from the y-axis and a reflection in the y-axis.

E. a dilation by a scale factor of 2 from the x-axis and a reflection in the y-axis.

Question 10

The graph of the function with equation $y = Ae^x + B$, where A and B are constants is shown below.



The values of A and B, respectively, are

A. $A = -2$ $B = 0$

B. $A = 0$ $B = -2$

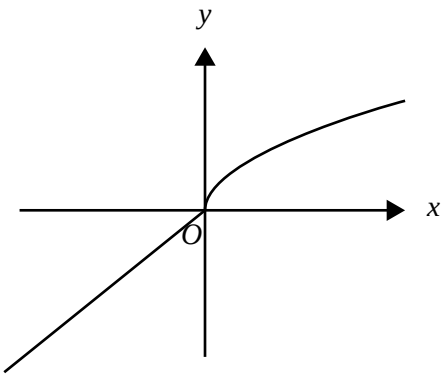
C. $A = -2$ $B = -2$

D. $A = -2$ $B = 2$

E. $A = 2$ $B = -2$

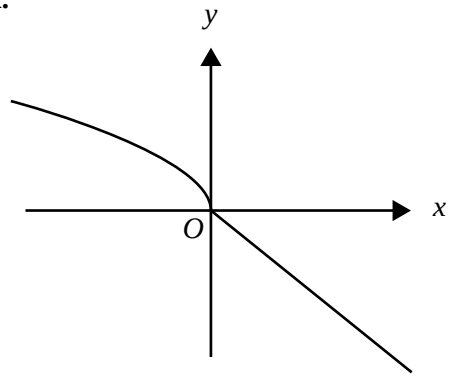
Question 11

The graph of the function with equation $y = f(x)$ is shown below. (A one-to-one scale has been used.)

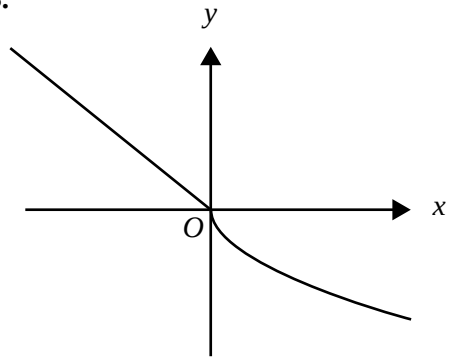


Which one of the following is most likely to be the graph of the inverse function?

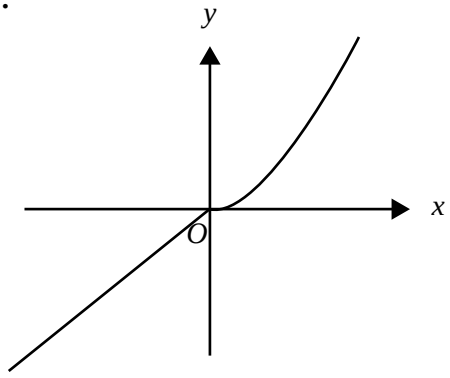
A.



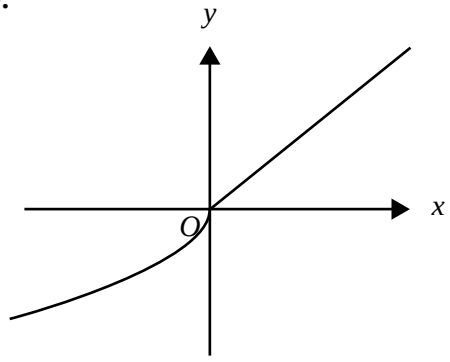
B.



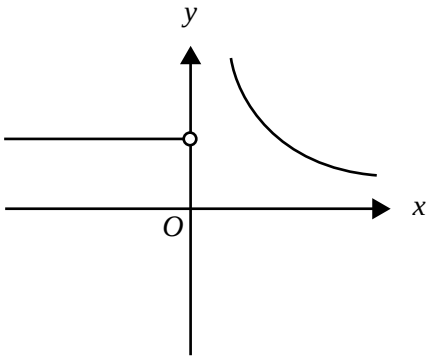
C.



D.

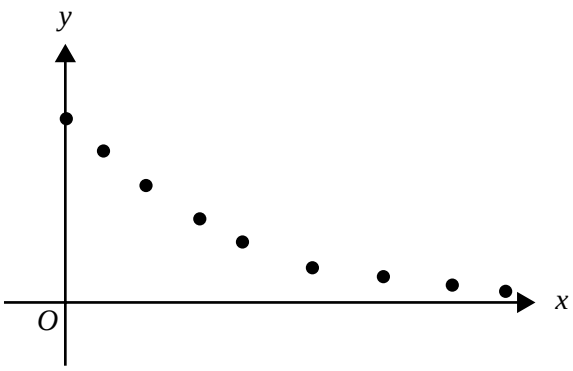


E.



Question 12

The relationship between two quantities, x and y, is represented graphically as shown below.



If ***a* is a negative real constant**, the equation relating x and y is most likely to be of the form

A. $y = \frac{a}{x}$

B. $y = ax^2$

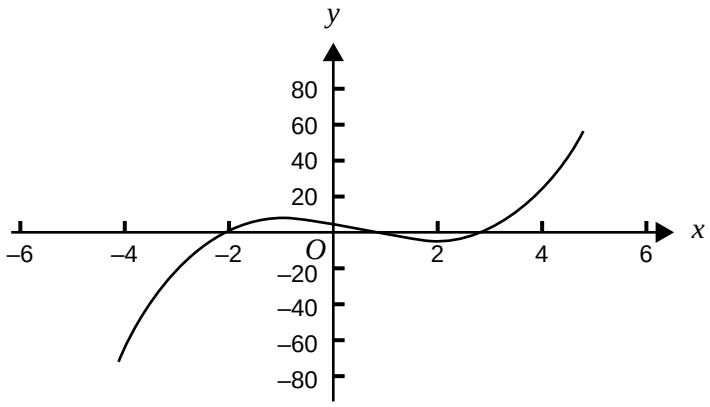
C. $y = ax^{\frac{1}{2}}$

D. $y = a \log_e(x)$

E. $y = e^{ax}$

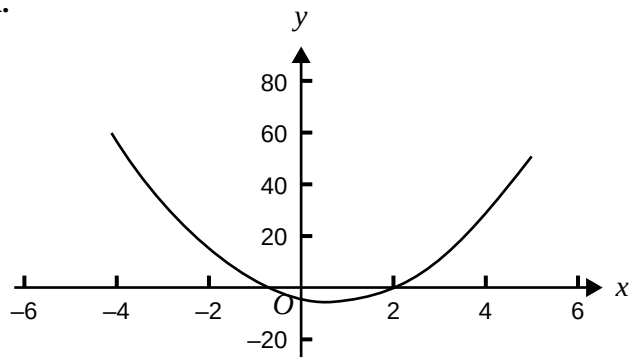
Question 13

The graph of the function with equation $y = f(x)$ is shown below.

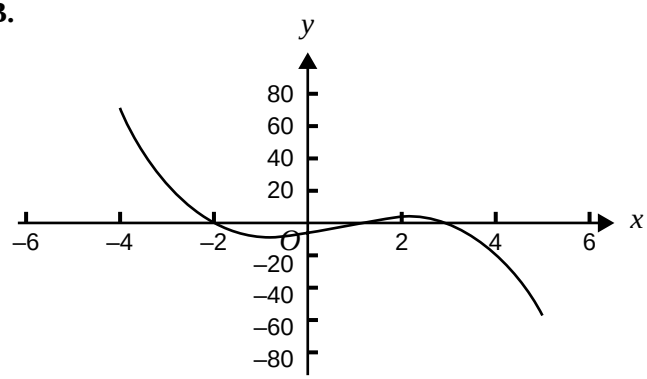


Which one of the following is most likely to be the graph of the derivative function with equation $y = f'(x)$?

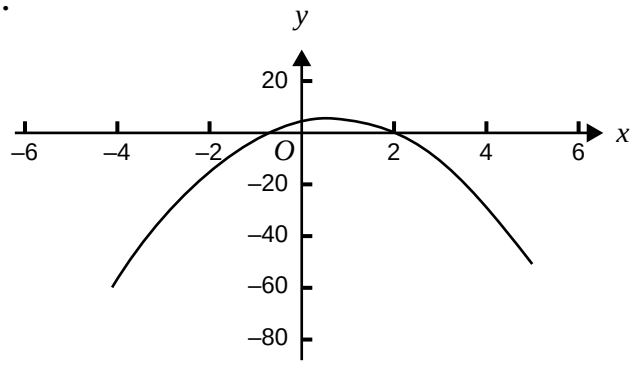
A.



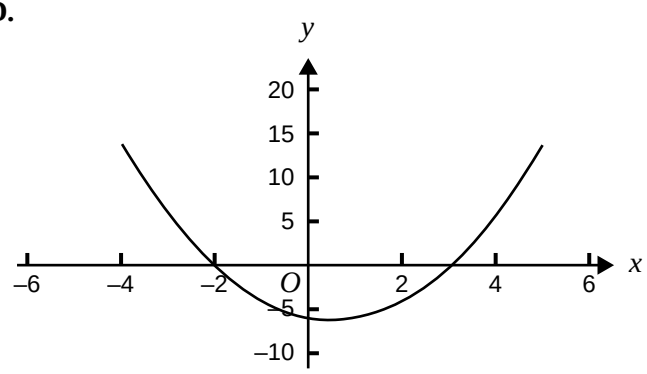
B.



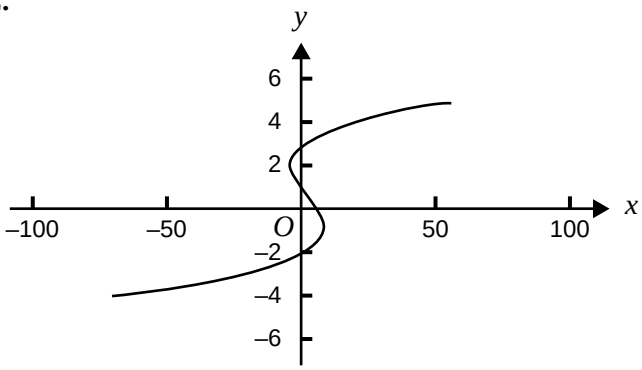
C.



D.



E.



Question 14

The derivative of $\log_e(2x)$ with respect to x is

A. $\frac{1}{x}$

B. $\frac{2}{x}$

C. $\frac{1}{2x}$

D. $\log_e(2) + 2$

E. $\frac{1}{x} + \frac{1}{2}$

Question 15

The derivative of $\frac{x}{\sin(x)}$ is

A. $\frac{\sin(x) - x\cos(x)}{\sin^2(x)}$

B. $\frac{x\cos(x) - \sin(x)}{\sin^2(x)}$

C. $\frac{1}{\cos(x)}$

D. $\frac{1 - x\cos(x)}{\sin(x)}$

E. $\frac{\sin(x) + x\cos(x)}{\sin^2(x)}$

Question 16

For the curve of the function with equation $y = (x + 2)(x - 1)(x - 3)$, the subset of R for which the gradient of the graph of this function is negative, is best described by

A. (–0.79, 2.12)

B. (1, 3)

C. (–∞, –2)

D. (–2, 1)

E. (2.12, ∞)

Question 17

The equation of the tangent to the curve of the function with equation $y = 2x^{\frac{3}{2}}$ at the point where $x = 4$ is

A. $y = -\frac{1}{6}x + \frac{50}{3}$

B. $y = 6x - 18$

C. $y = 6x - 8$

D. $y = 6x + 40$

E. $y = 3x^{\frac{1}{2}}$

Question 18

Using the left rectangle approximation with rectangles of width 1, the area of the region bounded by the curve $y = x^3$, the x-axis, and the lines $x = 0$ and $x = 3$ is approximated by

A. 9

B. 20

C. 20.25

D. 22.5

E. 36

Question 19

Note: C is a real constant.

$\int (2x + 5)^{\frac{3}{2}} dx$ is equal to

A. $\frac{2}{5}(2x + 5)^{\frac{5}{2}} + C$

B. $\frac{1}{2}(2x + 5)^{\frac{1}{2}} + C$

C. $\frac{1}{5}(2x + 5)^{\frac{5}{2}} + C$

D. $\frac{4}{5}(2x + 5)^{\frac{5}{2}} + C$

E. $3(2x + 5)^{\frac{1}{2}} + C$

Question 20

The area of the region enclosed by the curve $y = x^2$ and the line $y = 4$ is

A. $\frac{8}{3}$

B. $\frac{16}{3}$

C. 6

D. $\frac{26}{3}$

E. $\frac{32}{3}$

Question 21

Let p be a function defined on the interval [1, 2], and q a function such that $q'(x) = p(x)$, for all $x \in [1, 2]$

$\int_1^2 p(x)dx$ is equal to

A. $p(x) + C$, where C is a real constant

B. $p(2) - p(1)$

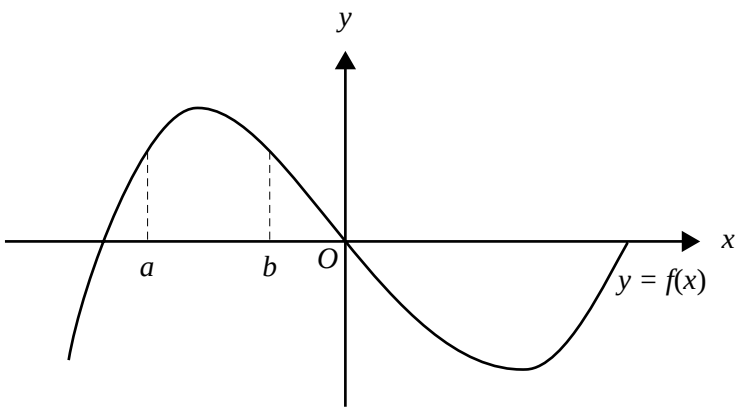
C. $q(2) - q(1)$

D. $q'(2) - q'(1)$

E. $q(x) + C$, where C is a real constant

Question 22

The graph of the function with equation $y = f(x)$ is shown below.



Let g be a function such that $g'(x) = f(x)$.

On the interval (a, b), the graph of g will

A. have a negative gradient.

B. have a positive gradient.

C. have a local minimum value.

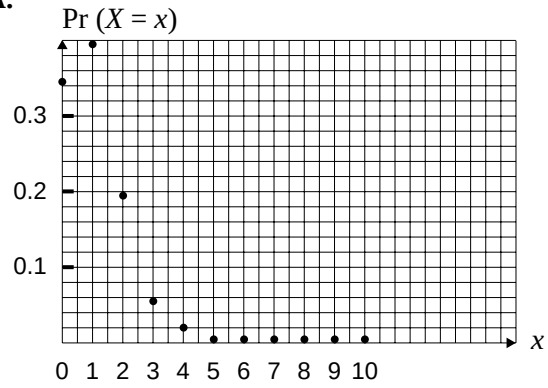
D. have a local maximum value.

E. have a zero gradient.

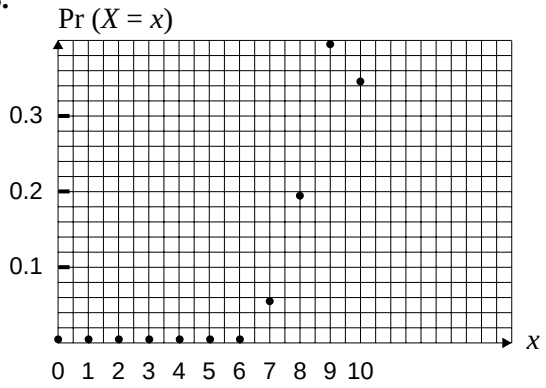
Question 23

Which one of the following graphs best represents the shape of a binomial distribution of the random variable X with ten independent trials and probability of success for each trial being 0.9?

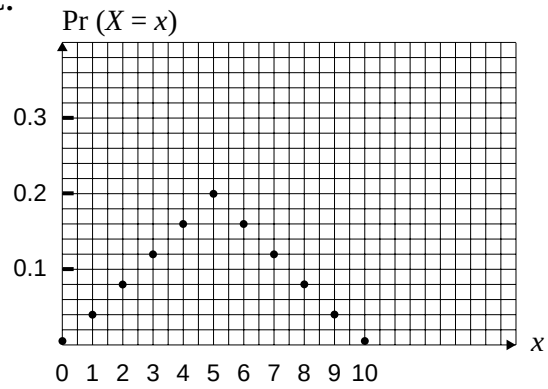
A.



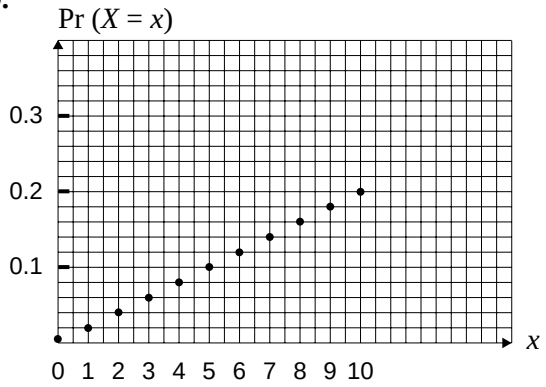
B.



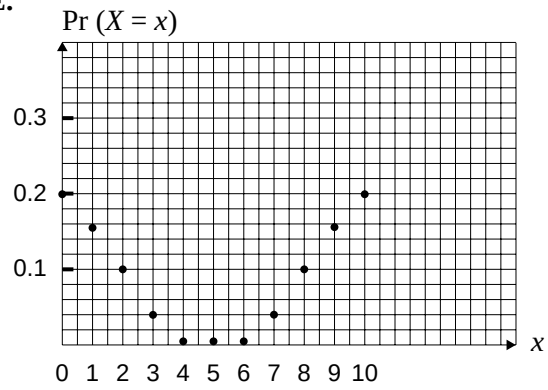
C.



D.



E.



Question 24

A badminton team of four players is to be selected at random from six women and four men. What is the probability that the team consists of exactly one woman and three men?

A. $\frac{{}^6C_1 \times {}^4C_3}{{}^{10}C_4}$

B. $\frac{{}^6C_3 \times {}^4C_1}{{}^{10}C_4}$

C. 0.6

D. ${}^4C_1 (0.6)^1 (0.4)^3$

E. ${}^4C_1 (0.4)^1 (0.6)^3$

Question 25

Let X be a normally distributed random variable with mean μ and standard deviation σ. Which one of the following is **not** always true?

A. $\Pr(X < \mu) = 0.5$

B. $\Pr(\mu - \sigma < X < \mu + \sigma) \approx 0.68$

C. $\Pr(X < a) = 1 - \Pr(X > a)$

D. $\Pr(\mu - 2\sigma < X < \mu + 2\sigma) \approx 0.95$

E. $\Pr(a < X < b) = \Pr(X < b) - \Pr(X > a)$

Question 26

A large box contains 100 motorcar tyres, ten of which are defective. A random sample of five is taken without replacement and checked.

The variance of the number of defective tyres in the sample is closest to

A. 0.19

B. 0.43

C. 0.45

D. 0.66

E. 0.67

Question 27

The random variable X has the following probability distribution.

x	0	1	2
$\Pr(X = x)$	a	b	0.5

If the mean of X is 1.2, then the value of a is

A. 0

B. 0.2

C. 0.25

D. 0.3

E. 0.5

Working space

END OF PART I MULTIPLE-CHOICE QUESTION BOOK

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

Figures										Letter
Words										

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2001

MATHEMATICAL METHODS

Written examination 1
(Facts, skills and applications)

Friday 9 November 2001

Reading time: 9.00 am to 9.15 am (15 minutes)
Writing time: 9.15 am to 10.45 am (1 hour 30 minutes)

PART II

QUESTION AND ANSWER BOOK

Directions to students

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Part I consists of a separate question book and must be answered on the answer sheet provided for multiple-choice questions.
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Structure of book

Number of questions	*Number of questions to be answered*	*Number of marks*
7	7	23

Materials
- Question and answer book of 8 pages, including two blank pages for rough working.
- Up to four pages (two A4 sheets) of pre-written notes (typed or handwritten).
- An approved scientific and/or graphics calculator, ruler, protractor, set-square and aids for curve-sketching.

Instructions
- Detach the formula sheet from the centre of the Part I book during reading time.
- Write your **student number** in the space provided on the cover of this book.
- A decimal approximation will not be accepted if an exact answer is required to a question.
- Where an exact answer is required to a question, appropriate working must be shown.
- Where an instruction to **use calculus** is stated for a question, you must show an appropriate derivative or anti-derivative.
- Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.
- All written responses must be in English.

At the end of the examination
- Place the answer sheet for multiple-choice questions (Part I) inside the front cover of this question and answer book (Part II).

Working space

Instructions for Part II

Answer **all** questions in the spaces provided.

Question 1

A box contains six live batteries and four dead batteries.

a. Romeo selects three batteries at random **with replacement** and tests them. Calculate the probability that Romeo has selected exactly two live batteries in his sample.

b. Juliet is given the same box of ten batteries, unaware of which batteries are live and which are dead. She selects three batteries at random **without replacement** and tests them. Calculate the probability that Juliet has exactly one live battery in her sample.

2 + 2 = 4 marks

Question 2

Let $f: R \rightarrow R,\ f(x) = 2x^2 + 12x + 10$

a. Write $f(x)$ in the form $a(x + b)^2 + c$.

b. **Hence**, write down the coordinates of the turning point of the graph of f.

1 + 1 = 2 marks

Question 3

Find the smallest exact value of x, $x > 0$, which satisfies the equation $\sin\left(5x + \frac{\pi}{3}\right) = -\frac{\sqrt{2}}{2}$.

3 marks

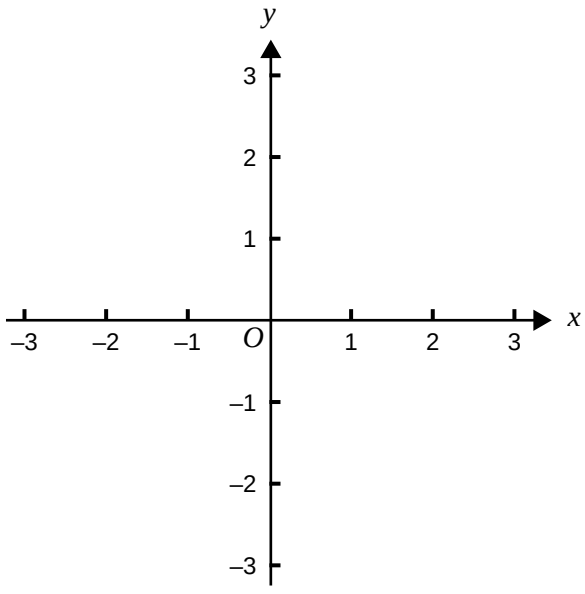
Question 4

Let $f: D \to R$, $f(x) = \frac{x}{x+1}$ where D is the largest subset of R for which f is defined.

a. Express $f(x)$ in the form $f(x) = \frac{A}{x+b} + B$.

b. State D.

c. On the axes below, sketch the graph of the function with equation $y = f(x)$. Clearly mark the coordinates of the points of intersection with the axes. Clearly label any asymptotes with their equations.



1 + 1 + 2 = 4 marks

TURN OVER

Question 5

Let $V: [0, \infty) \rightarrow R$ be given by $V(t) = -0.5\,(t + 5)^2 + 2000$.

a. Find the value of t for which the instantaneous rate of change of V with respect to t is –10.

b. Find the average rate of change of V with respect to t over [0, 2].

2 + 2 = 4 marks

Question 6

Given $f: R \rightarrow R$, $f(x) = (x - 1)2^{x-1}$, find

a. the value(s) of x for which $f(x) = 0$.

b. the minimum value of f, correct to three decimal places.

c. the value of $f'(0)$ correct to three decimal places.

1 + 1 + 1 = 3 marks

Question 7

$\int_2^a \frac{1}{2(x-1)}\,dx = 1$. Find the exact value of a, where $a > 2$.

3 marks

Working space

END OF PART II QUESTION AND ANSWER BOOK

Click here for Formula Sheet

MATHEMATICAL METHODS

Written examinations 1 and 2

FORMULA SHEET

Directions to students

Detach this formula sheet during reading time.

This formula sheet is provided for your reference.

Mathematical Methods Formulas

Mensuration

area of a trapezium: $\frac{1}{2}(a+b)h$

volume of a pyramid: $\frac{1}{3}Ah$

curved surface area of a cylinder: $2\pi rh$

volume of a sphere: $\frac{4}{3}\pi r^3$

volume of a cylinder: $\pi r^2 h$

area of a triangle: $\frac{1}{2}bc\sin A$

volume of a cone: $\frac{1}{3}\pi r^2 h$

Calculus

$$\frac{d}{dx}\left(x^n\right) = nx^{n-1} \qquad \int x^n dx = \frac{1}{n+1}x^{n+1} + c, n \neq -1$$

$$\frac{d}{dx}\left(e^{ax}\right) = ae^{ax} \qquad \int e^{ax}dx = \frac{1}{a}e^{ax} + c$$

$$\frac{d}{dx}\left(\log_e(x)\right) = \frac{1}{x} \qquad \int \frac{1}{x}dx = \log_e(x) + c, \text{for } x > 0$$

$$\frac{d}{dx}\left(\sin(ax)\right) = a\cos(ax) \qquad \int \sin(ax)\,dx = -\frac{1}{a}\cos(ax) + c$$

$$\frac{d}{dx}\left(\cos(ax)\right) = -a\sin(ax) \qquad \int \cos(ax)\,dx = \frac{1}{a}\sin(ax) + c$$

$$\frac{d}{dx}\left(\tan(ax)\right) = \frac{a}{\cos^2(ax)} = a\sec^2(ax)$$

product rule: $\frac{d}{dx}(uv) = u\frac{dv}{dx} + v\frac{du}{dx}$

chain rule: $\frac{dy}{dx} = \frac{dy}{du}\frac{du}{dx}$

quotient rule: $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$

approximation: $f(x+h) \approx f(x) + hf'(x)$

Statistics and Probability

$\Pr(A) = 1 - \Pr(A')$ $\qquad$ $\Pr(A \cup B) = \Pr(A) + \Pr(B) - \Pr(A \cap B)$

$\Pr(A|B) = \frac{\Pr(A \cap B)}{\Pr(B)}$

mean: $\mu = \mathrm{E}(X)$ $\qquad$ variance: $\mathrm{var}(X) = \sigma^2 = \mathrm{E}((X-\mu)^2) = \mathrm{E}(X^2) - \mu^2$

Discrete distributions			
	$\Pr(X = x)$	mean	variance
general	$p(x)$	$\mu = \Sigma\, x\, p(x)$	$\sigma^2 = \Sigma\,(x-\mu)^2 p(x) = \Sigma\, x^2 p(x) - \mu^2$
binomial	${}^nC_x\, p^x (1-p)^{n-x}$	np	$np(1-p)$
hypergeometric	$\frac{{}^DC_x\, {}^{N-D}C_{n-x}}{{}^NC_n}$	$n\frac{D}{N}$	$n\frac{D}{N}\left(1-\frac{D}{N}\right)\left(\frac{N-n}{N-1}\right)$
Continuous distributions			
normal	If X is distributed $\mathrm{N}(\mu, \sigma^2)$ and $Z = \frac{X-\mu}{\sigma}$, then Z is distributed N(0, 1).		

Table 1 Normal distribution – cdf

x	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359	4	8	12	16	20	24	28	32	36
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753	4	8	12	16	20	24	28	32	35
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141	4	8	12	15	19	23	27	31	35
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517	4	8	11	15	19	23	26	30	34
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879	4	7	11	14	18	22	25	29	32
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224	3	7	10	14	17	21	24	27	31
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549	3	6	10	13	16	19	23	26	29
0.7	.7580	.7611	.7642	.7673	.7703	.7734	.7764	.7793	.7823	.7852	3	6	9	12	15	18	21	24	27
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133	3	6	8	11	14	17	19	22	25
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389	3	5	8	10	13	15	18	20	23
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621	2	5	7	9	12	14	16	18	21
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830	2	4	6	8	10	12	14	16	19
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015	2	4	6	7	9	11	13	15	16
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177	2	3	5	6	8	10	11	13	14
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319	1	3	4	6	7	8	10	11	13
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441	1	2	4	5	6	7	8	10	11
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545	1	2	3	4	5	6	7	8	9
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633	1	2	3	3	4	5	6	7	8
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706	1	1	2	3	4	4	5	6	6
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767	1	1	2	2	3	4	4	5	5
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817	0	1	1	2	2	3	3	4	4
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857	0	1	1	2	2	2	3	3	4
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890	0	1	1	1	2	2	2	3	3
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916	0	1	1	1	1	2	2	2	2
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936	0	0	1	1	1	1	1	2	2
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952	0	0	0	1	1	1	1	1	1
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964	0	0	0	0	1	1	1	1	1
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974	0	0	0	0	0	1	1	1	1
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981	0	0	0	0	0	0	0	1	1
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986	0	0	0	0	0	0	0	0	0
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990	0	0	0	0	0	0	0	0	0
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993	0	0	0	0	0	0	0	0	0
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995	0	0	0	0	0	0	0	0	0
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997	0	0	0	0	0	0	0	0	0
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998	0	0	0	0	0	0	0	0	0
3.5	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	0	0	0	0	0	0	0	0	0
3.6	.9998	.9998	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	0	0	0	0	0	0	0	0	0
3.7	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	0	0	0	0	0	0	0	0	0
3.8	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	0	0	0	0	0	0	0	0	0
3.9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0	0	0	0	0	0	0	0	0

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