THE HEFFERNAN GROUP

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Student Name..

MATHEMATICAL METHODS UNITS 3 & 4

TRIAL EXAMINATION 1

(FACTS, SKILLS AND APPLICATIONS TASK)

2005

Reading Time: 15 minutes
Writing time: 90 minutes

Instructions to students

This exam consists of Part I and Part II.
Part I consists of 27 multiple-choice questions, which should be answered on the detachable answer sheet which can be found on page 22 of this exam.
Part II consists of 6 short-answer questions that should be answered in the spaces provided.
Part I begins on page 2 of this exam and is worth 27 marks.
Part II begins on page 14 of this exam and is worth 23 marks.
There is a total of 50 marks available.
All questions in Part I and Part II should be answered.
Students may bring up to two A4 pages of pre-written notes into the exam.
Formula sheets and a table of the Normal distribution - cdf can be found on pages 19 - 21 of this exam.

PART I

Question 1

Which one of the following random variables is a discrete random variable?

A. the depth of water in a swimming pool
B. the height of a high-jump bar on the last competitor's jump
C. the number of goals scored by the Australian hockey team in a match
D. the distance run by a marathon runner
E. the weight of a boxer before their first fight

Question 2

Nic collects the office mail five mornings per week. The probability that there is no office mail on exactly two mornings is given by

$$^{5}C_2(0\cdot 1)^2(0\cdot 9)^3.$$

The mean and variance of the number of occasions that Nic finds there is no office mail is

	Mean	Variance
A.	0.2	0.18
B.	0.2	0.3
C.	0.3	0.27
D.	0.5	0.18
E.	0.5	0.45

Question 3

The random variable X follows a normal distribution with mean 15.3 and standard deviation 1.5. If the standard normal distribution is represented by Z then the probability that X is greater than 18.3 is equal to

A. $\Pr(z < -2)$
B. $\Pr(z > 1)$
C. $\Pr(-2 < z < 2)$
D. $1 - \Pr(z < -2)$
E. $1 - \Pr(z > 2)$

Question 4

A packet of donuts contains five with pink icing and seven with chocolate icing. Lorna randomly selects two donuts and places them in her son's lunchbox. The probability that her son has a donut with pink icing and a donut with chocolate icing is

A. $\frac{1}{35}$

B. $\frac{5}{33}$

C. $\frac{1}{6}$

D. $\frac{5}{18}$

E. $\frac{35}{66}$

Question 5

One in four Victorians are forecast to attend at least one Commonwealth Games event. If this forecast was correct, in a random sample of twenty Victorians, what is the probability that only one of them would be attending at least one Commonwealth Games event?

A. $(0 \cdot 25)^{20}$

B. $5 \times (0 \cdot 75)^{19}$

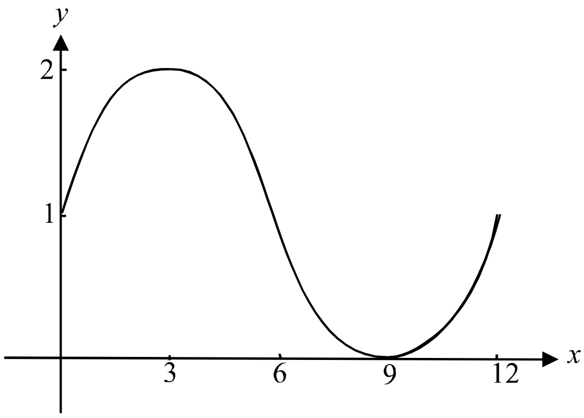
C. $(0 \cdot 25)^{1}(0 \cdot 75)^{19}$

D. $0 \cdot 05^{0 \cdot 25}(0 \cdot 95)^{0 \cdot 75}$

E. $1 - {}^{20}C_0 (0 \cdot 25)^0 (0 \cdot 75)^{20}$

Question 6

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



A possible equation for the rule of the function shown is

A. $y = 2\cos(12x) - 1$

B. $y = \cos\left(\frac{\pi x}{6}\right) + 1$

C. $y = \sin(12x) + 1$

D. $y = 2\sin(12\pi x) + 1$

E. $y = \sin\left(\frac{\pi x}{6}\right) + 1$

Question 7

The sum of the solutions of $\sin\left(\frac{x}{3}\right) = \frac{1}{\sqrt{2}}$, for $0 \le x \le 3\pi$ is

A. π

B. 2π

C. 3π

D. $\frac{13\pi}{4}$

E. $\frac{39\pi}{4}$

Question 8

On the graph of the function with equation $y = \tan(ax)$ two adjacent asymptotes occur at

$x = \frac{\pi}{6}$ and $x = \frac{\pi}{2}$.

A possible value of a is

A. $\frac{\pi}{6}$

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

C. 2

D. 3

E. 6

Question 9

When $(ax+2)^6$ is expanded and simplified, the coefficient of the x^2 term is 6000. The value of a could be

A. –5

B. 3

C. $\sqrt{18 \cdot 75}$

D. $\sqrt{37 \cdot 5}$

E. $\sqrt{62 \cdot 5}$

Question 10

The linear factors of $x^4 + 3x^3 - 2x^2 - 2x$ over R are

A. $0,\ 1,\ -2 \pm \sqrt{2}$

B. $x-1,\ x+2-\sqrt{2},\ x+2+\sqrt{2}$

C. $x,\ x-2,\ x^2+4x+2$

D. $x,\ x-1,\ x+2-\sqrt{2},\ x+2+\sqrt{2}$

E. $x,\ x-1,\ x-2-\sqrt{2},\ x-2+\sqrt{2}$

Question 11

The expression $10^{\log_{10}(x-3)}$ can be simplified to

A. $3-x$

B. $x-3$

C. $\log_{10}(x) - \log_{10}(3)$

D. $10^{(x-3)}$

E. $10(3-x)$

Question 12

If $\log_a(x)-\log_a(2x^2)=3\log_a(x)+1$ then x is equal to

A. 0

B. $\dfrac{1}{2}$

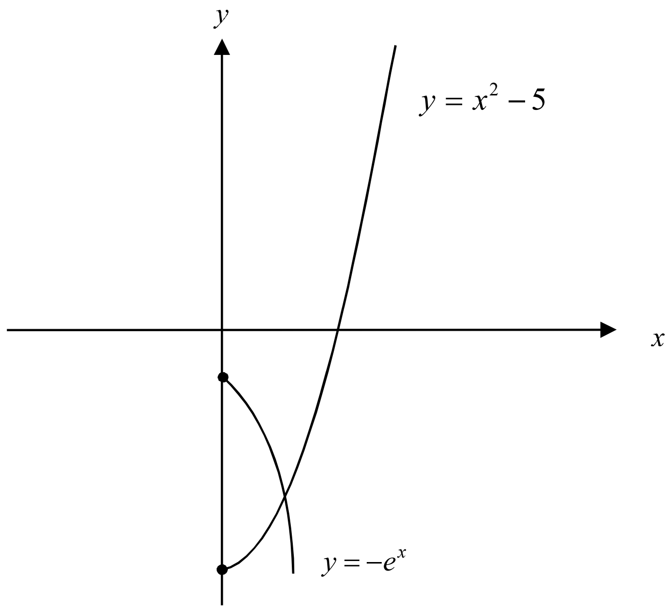
C. $\sqrt{2a}$

D. $\sqrt{\dfrac{1}{2a}}$

E. $\sqrt[4]{\dfrac{1}{2a}}$

Question 13

The graphs of the functions with equations $y=-e^x$ and $y=x^2-5$ are shown on the graph below for $x\geq 0$.



The solution of the equation $-e^x = x^2-5$ is closest to

A. –3.46
B. –2.21
C. 0.11
D. 1.24
E. 2.59

Question 14

A polynomial function *f* has degree 3. It touches, but does not intersect the *x*-axis at $x = -1$. Which one of the following could be the rule for *f*?

A. $f(x) = (x+1)^2$

B. $f(x) = -x(x+1)^2$

C. $f(x) = x^2(x+1)$

D. $f(x) = x(x+1)(x-3)$

E. $f(x) = -x(x+3)(x+1)^2$

Question 15

Which one of the following functions is not $1:1$?

A. $g:(0,\infty) \to R,\ g(x) = \dfrac{1}{x}$

B. $p:(-\infty,1] \to R,\ p(x) = \sqrt{1-x}$

C. $h: R \to R,\ h(x) = x^2 + 1$

D. $q: R \to R, q(x) = -x^3 + 1$

E. $f:[0,5] \to R,\ f(x) = \sqrt{x}$

Question 16

The inverse function of $f:(-\infty,2) \to R,\ f(x) = \dfrac{3}{x-2} + 1$ is given by

A. $f^{-1}:(-\infty,1) \to R,\ f^{-1}(x) = \dfrac{3}{x-1} + 2$

B. $f^{-1}:(-\infty,1) \to R,\ f^{-1}(x) = \dfrac{3}{x-2} + 1$

C. $f^{-1}:(-\infty,2) \to R,\ f^{-1}(x) = \dfrac{3}{x-2} + 1$

D. $f^{-1}:(-\infty,1) \cup (1,\infty) \to R,\ f^{-1}(x) = \dfrac{3}{x-1} + 2$

E. $f^{-1}:(-\infty,2) \cup (2,\infty) \to R,\ f^{-1}(x) = \dfrac{3}{x-2} + 1$

Question 17

The graph of the function *h* with rule $h(x)=\frac{1}{x^2}$ is dilated by a factor of 2 from the *x*-axis and dilated by a factor of 3 from the *y*-axis.

The resulting function *g* has the rule

A. $g(x)=\frac{2}{3x^2}$

B. $g(x)=\frac{3}{2x^2}$

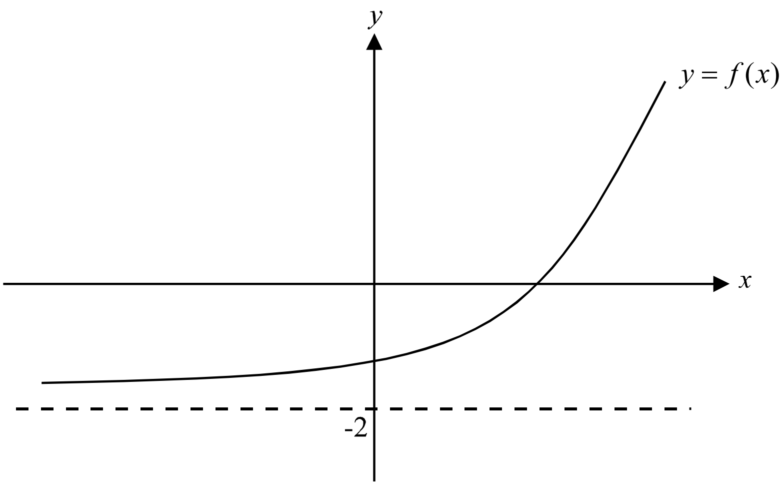
C. $g(x)=\frac{2}{9x^2}$

D. $g(x)=\frac{12}{x^2}$

E. $g(x)=\frac{18}{x^2}$

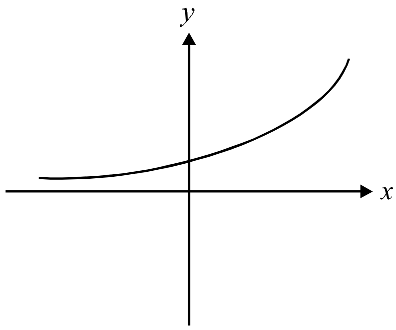
Question 18

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

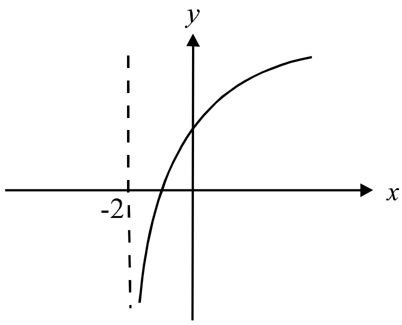


Which one of the following could be the graph of $y = f'(x)$?

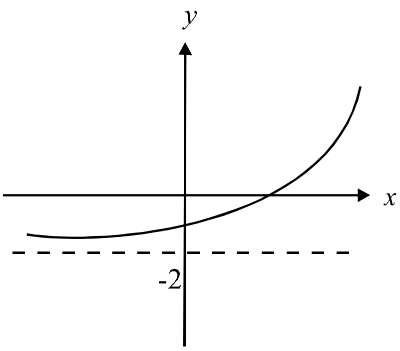
A.



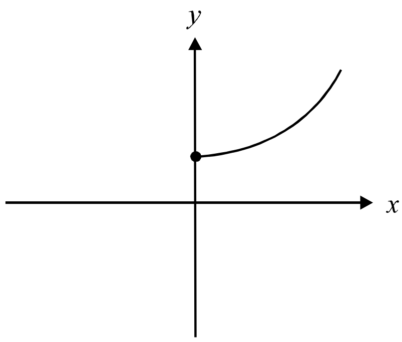
B.



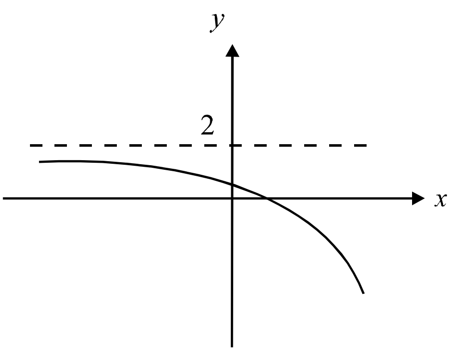
C.



D.



E.



Question 19

If $y = 3\tan\left(\frac{x}{2}\right)$ then $\frac{dy}{dx}$ is equal to

A. $\frac{2}{3}\sec^2\left(\frac{x}{2}\right)$

B. $\frac{3}{2}\sec^2\left(\frac{x}{2}\right)$

C. $6\sec^2\left(\frac{x}{2}\right)$

D. $3\cos^2\left(\frac{x}{2}\right)$

E. $6\cos^2\left(\frac{x}{2}\right)$

Question 20

If $y = \log_e(\cos(3x))$ then the rate of change of y with respect to x is equal to

A. $\frac{1}{\cos(3x)}$

B. $\frac{-1}{3\sin(3x)}$

C. $-3\sin(3x)$

D. $-3\tan(3x)$

E. $3\tan(3x)$

Question 21

The gradient of the tangent to the curve $y = \frac{e^{2x}}{\sin(x)}$ at the point where $x = \frac{\pi}{2}$ is

A. $-e^{\pi}$

B. $e^{\frac{\pi}{2}}$

C. e^{π}

D. $2e^{\pi}$

E. undefined

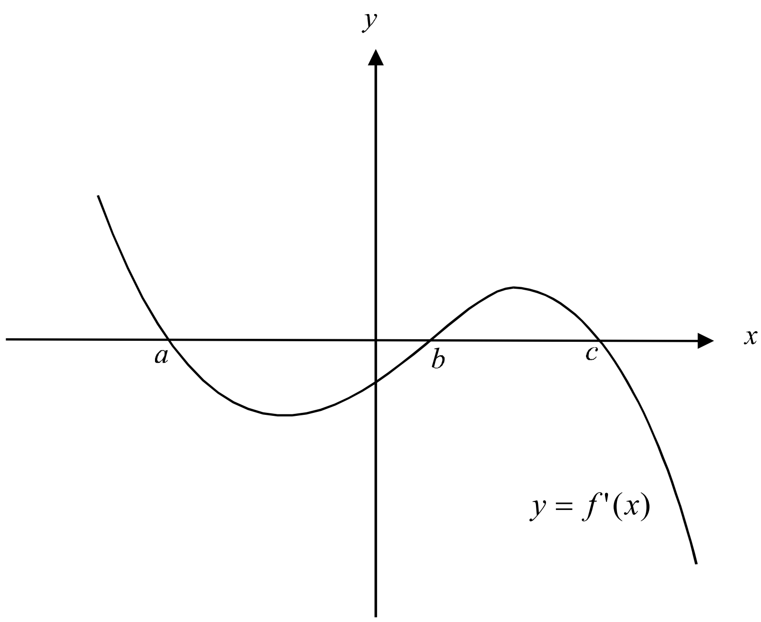
Question 22

Using the approximation formula $f(x+h) \approx f(x) + hf'(x)$ where $f(x) = x^{-2}$ with $x = 3$, an approximate value for $\dfrac{1}{(3 \cdot 01)^2}$ is given by

A. $f\left(\dfrac{1}{9}\right) + 0 \cdot 01 f'\left(\dfrac{1}{9}\right)$
B. $f(3) + 0 \cdot 1 f'(3)$
C. $f(3) + 0 \cdot 01 f'(3)$
D. $f(3) - 0 \cdot 1 f'(3)$
E. $f(9) - 0 \cdot 01 f'(9)$

Question 23

The graph of $y = f'(x)$ is shown below.



On the graph of the function $y = f(x)$; at the points where $x = a,\ x = b,$ and $x = c$, there will be respectively

A. three stationary points
B. three points of inflection
C. two turning points and one point of inflection
D. three x-intercepts
E. three points of inflection with zero gradient

Question 24

Using the left rectangles method of approximation with rectangles of width one unit, the approximate area of the region bounded by the positive x-axis, the y-axis and the curve with equation $y = \sqrt{4 - x^2}$ is given by

A. $\sqrt{3}$
B. $2\sqrt{3}$
C. $\sqrt{7}$
D. $2 + \sqrt{3}$
E. $4 + \sqrt{3}$

Question 25

$\int_{-1}^{2} (1 - 3f(x))dx$ can be written as

A. $\int_{-1}^{2} (x - 3f(x))\, dx$

B. $3\int_{-1}^{2} (x - 3f(x))\, dx$

C. $1 - 3\int_{-1}^{2} f(x)dx$

D. $3 - 3\int_{-1}^{2} f(x)dx$

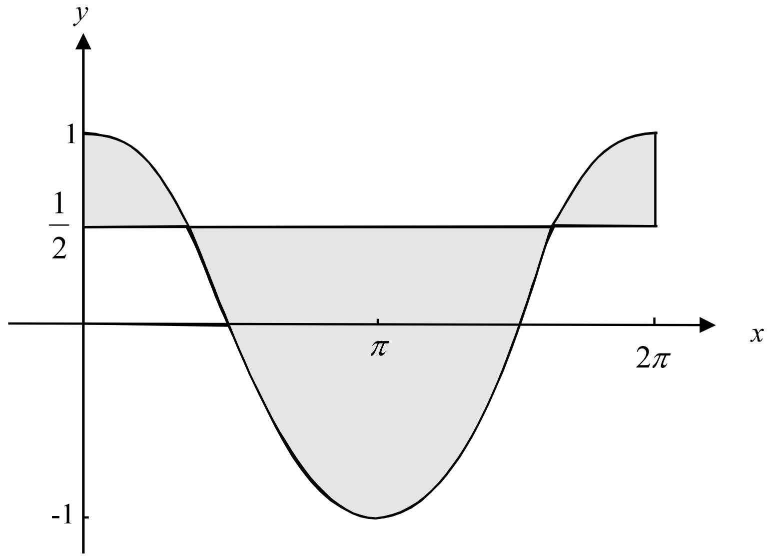
E. $x - 3\int_{-1}^{2} f(x)dx$

Question 26

If $\int_{0}^{n} (3 - 2x)dx = -4,\ n > 0,$ then n is equal to

A. -1
B. 0
C. 1
D. 2
E. 4

Question 27



The graphs of $y = \cos(x)$ and $y = \frac{1}{2}$ for $0 \le x \le 2\pi$ are shown above. The shaded regions are the regions enclosed by the graphs of $y = \cos(x)$ and $y = \frac{1}{2}$, the y-axis and the line $x = 2\pi$.
The total area of these shaded regions is given by

A. $\displaystyle\int_0^{\frac{\pi}{6}}\left(\cos(x)-\frac{1}{2}\right)dx+\int_{\frac{\pi}{6}}^{\frac{\pi}{6}}\left(\cos(x)-\frac{1}{2}\right)dx+\int_{\frac{11\pi}{6}}^{2\pi}\left(\cos(x)-\frac{1}{2}\right)dx$

B. $\displaystyle\int_0^{\frac{\pi}{6}}\left(\cos(x)-\frac{1}{2}\right)dx-\int_{\frac{\pi}{6}}^{\frac{\pi}{6}}\left(\cos(x)-\frac{1}{2}\right)dx-\int_{\frac{11\pi}{6}}^{2\pi}\left(\cos(x)-\frac{1}{2}\right)dx$

C. $\displaystyle\int_0^{\frac{\pi}{4}}\left(\cos(x)-\frac{1}{2}\right)dx-\int_{\frac{\pi}{4}}^{\frac{7\pi}{4}}\left(\cos(x)-\frac{1}{2}\right)dx+\int_{\frac{7\pi}{4}}^{2\pi}\left(\cos(x)-\frac{1}{2}\right)dx$

D. $\displaystyle\int_0^{\frac{\pi}{3}}\left(\cos(x)-\frac{1}{2}\right)dx-\int_{\frac{\pi}{3}}^{\frac{5\pi}{3}}\left(\cos(x)-\frac{1}{2}\right)dx+\int_{\frac{5\pi}{3}}^{2\pi}\left(\cos(x)-\frac{1}{2}\right)dx$

E. $\displaystyle\int_0^{\frac{\pi}{3}}\left(\cos(x)-\frac{1}{2}\right)dx+\int_{\frac{\pi}{3}}^{\frac{5\pi}{3}}\left(\cos(x)-\frac{1}{2}\right)dx+\int_{\frac{5\pi}{3}}^{2\pi}\left(\cos(x)-\frac{1}{2}\right)dx$

PART II

Question 1

When $x^4 + ax^3 + 9x^2 - ax - 5$ is divided by $x + 2$, the remainder is 5. What is the value of a?

2 marks

Question 2

a. Write down the probability distribution of the number of sixes that occur when a fair die is thrown twice by completing the table below.

Number of sixes (x)	Probability $\Pr(X = x)$
0	
1	
2	

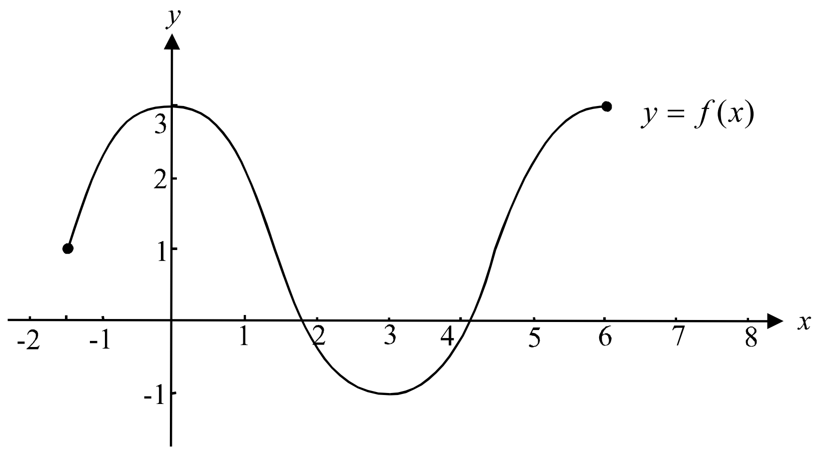
b. Find the expected number of sixes that occur when a fair die is thrown twice.

c. Find the variance of the number of sixes that occur when a fair die is thrown twice.

$2 + 1 + 1 = 4$ marks

Question 3

The diagram below shows the graph of the circular function $y = f(x)$.



a. State the period of the function *f*.

____

b. State the amplitude of the function *f*.

____

c. State the domain of the function *f*.

____

d. If the equation $f(x) = b$ has two solutions, write down the values that *b* can have.

____

____

$1 + 1 + 1 + 2 = 5$ marks

Question 4

Consider the function $h:[0,10] \rightarrow R$, where $h(t) = 2(t-1)^3 + 1$

a. Find the average rate of change of h with respect to t over $[0, 5]$.

b. Find the value of t for which the instantaneous rate of change of h with respect to t is 54.

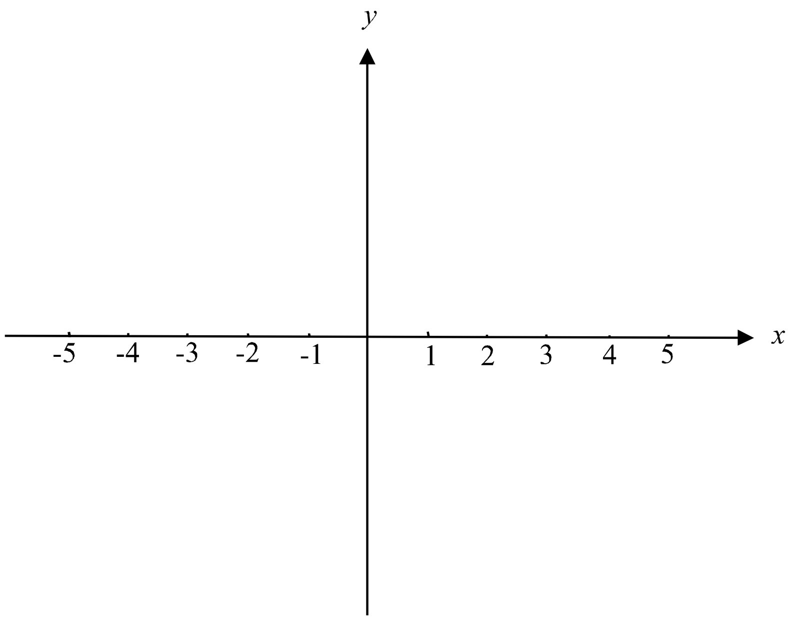
2 + 2 = 4 marks

Question 5

The function g is a continuous function with $d_g = R$. The function g has the following properties

$$g(1)=0 \qquad g'(1)=0$$
$$g(-2)=0 \qquad g'(-1)=0$$
$$g'(x)<0 \text{ for } (-1,1)\cup(1,\infty)$$

a. Sketch the possible graph of g on the set of axes below.



b. Explain whether or not the inverse function $g^{-1}(x)$ exists.

$2+1=3$ marks

Question 6

a. Find the x-ordinates of the points of intersection of the line with equation $y = 5x + 11$ and the parabola with equation $y = 3x^2 - x + 2$.

b. Use calculus to find the area of the region bounded by the line with equation $y = 5x + 11$ and the parabola with equation $y = 3x^2 - x + 2$.

$2 + 3 = 5$ marks
Total 23 marks

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

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

$$\frac{d}{dx}\left(x^n\right) = nx^{n-1}$$

$$\int x^n\,dx = \frac{1}{n+1}x^{n+1} + c,\ n \neq -1$$

$$\frac{d}{dx}\left(e^{ax}\right) = ae^{ax}$$

$$\int e^{ax}\,dx = \frac{1}{a}e^{ax} + c$$

$$\frac{d}{dx}\left(\log_e(x)\right) = \frac{1}{x}$$

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

$$\frac{d}{dx}\left(\sin(ax)\right) = a\cos(ax)$$

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

$$\frac{d}{dx}\left(\cos(ax)\right) = -a\sin(ax)$$

$$\int \cos(ax)\,dx = \frac{1}{a}\sin(ax) + c$$

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

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

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

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

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

These formula sheets have been copied from the 2004 Maths Methods Exam 1. Teachers and students are reminded that changes to formulae sheets are notified in the VCE Bulletins and on the VCAA website at www.vcaa.vic.edu.au
The VCAA publish an exam issue supplement to the VCAA Bulletin.

Statistics and Probability

$\Pr(A) = 1 - \Pr(A')$

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

$\Pr(A/B) = \dfrac{\Pr(A \cap B)}{\Pr(B)}$

mean: $\mu = E(X)$

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

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	$\dfrac{{}^DC_x\, {}^{N-D}C_{n-x}}{{}^NC_n}$	$n\dfrac{D}{N}$	$n\dfrac{D}{N}\left(1-\dfrac{D}{N}\right)\left(\dfrac{N-n}{N-1}\right)$

Continuous distributions

normal	If X is distributed $\mathrm{N}(\mu, \sigma^2)$ and $Z = \dfrac{X-\mu}{\sigma}$ then Z is distributed $\mathrm{N}(0, 1)$.

MATHEMATICAL METHODS

TRIAL EXAMINATION 1

MULTIPLE- CHOICE ANSWER SHEET

STUDENT NAME:..

INSTRUCTIONS

Fill in the letter that corresponds to your choice. Example: A ■ C D E

The answer selected is B. Only one answer should be selected.

1. A B C D E	10. A B C D E	19. A B C D E
2. A B C D E	11. A B C D E	20. A B C D E
3. A B C D E	12. A B C D E	21. A B C D E
4. A B C D E	13. A B C D E	22. A B C D E
5. A B C D E	14. A B C D E	23. A B C D E
6. A B C D E	15. A B C D E	24. A B C D E
7. A B C D E	16. A B C D E	25. A B C D E
8. A B C D E	17. A B C D E	26. A B C D E
9. A B C D E	18. A B C D E	27. A B C D E