2020 HSC Mathematics Extension 1 Marking Guidelines

Section I

Multiple-choice Answer Key

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

Section II

Question 11 (a) (i)

Criteria	Marks
• Provides correct solution	1

Sample answer:

$$\begin{aligned} P(2) &= 2^3 + 3(2)^2 - 13(2) + 6 \\ &= 0 \end{aligned}$$

Question 11 (a) (ii)

Criteria	Marks
• Provides correct solution	2
• Attempts to divide by $x - 2$, or equivalent merit	1

Sample answer:

$$\begin{array}{r} x^2 + 5x - 3 \\ x - 2 \overline{\big) x^3 + 3x^2 - 13x + 6} \\ \underline{x^3 - 2x^2} \qquad\qquad \\ 5x^2 - 13x \qquad \\ \underline{5x^2 - 10x} \qquad \\ -3x + 6 \\ \underline{-3x + 6} \\ 0 \end{array}$$

$$\therefore\ P(x) = (x - 2)(x^2 + 5x - 3)$$

Question 11 (b)

Criteria	Marks
• Provides correct solution	3
• Evaluates the dot product and sets it equal to 0, or equivalent value	2
• Writes a dot product $= 0$, or equivalent merit	1

Sample answer:

Since the vectors are perpendicular,

$$0 = \begin{pmatrix} a \\ -1 \end{pmatrix} \cdot \begin{pmatrix} 2a-3 \\ 2 \end{pmatrix}$$

$$0 = 2a^2 - 3a - 2$$

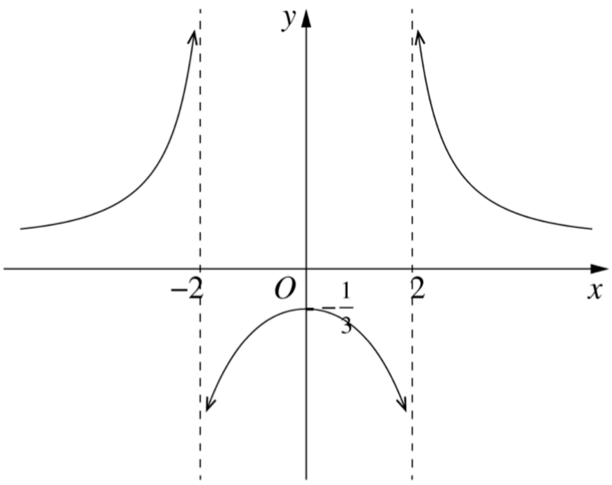
$$0 = (2a+1)(a-2)$$

$$a = -\frac{1}{2} \quad \text{or} \quad 2$$

Question 11 (c)

Criteria	Marks
• Provides correct sketch	3
• Provides a sketch with some correct features	2
• Marks asymptotes at $x = -2$ or 2, or marks local maximum at $y = -\frac{1}{3}$, or equivalent merit	1

Sample answer:



Question 11 (d)

Criteria	Marks
• Provides correct solution	4
• Correctly writes $\sqrt{3}\sin x + 3\cos x$ in the form $A\sin(x+\alpha)$ and finds one solution	3
• Finds A and α, or equivalent merit	2
• Finds the value of A, or equivalent merit	1

Sample answer:

$$\begin{aligned}\sqrt{3}\sin x + 3\cos x &= A\sin(x+\alpha)\\ &= A\sin x\cos\alpha + A\cos x\sin\alpha\end{aligned}$$

$$\therefore A\cos\alpha = \sqrt{3} \qquad (1)$$
$$A\sin\alpha = 3 \qquad (2)$$

dividing, $\tan\alpha = \dfrac{3}{\sqrt{3}} = \sqrt{3} \quad \Rightarrow \quad \alpha = \dfrac{\pi}{3}.$

$$\therefore A\cos\frac{\pi}{3} = \sqrt{3} \quad \Rightarrow \quad A = 2\sqrt{3}$$

$$\therefore \sqrt{3}\sin x + 3\cos x = 2\sqrt{3}\sin\left(x+\frac{\pi}{3}\right)$$

$$\begin{aligned}\text{so}\quad 2\sqrt{3}\sin\left(x+\frac{\pi}{3}\right) &= \sqrt{3}\\ \sin\left(x+\frac{\pi}{3}\right) &= \frac{1}{2}\\ x+\frac{\pi}{3} &= \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6},\\ x &= \frac{\pi}{2}, \frac{11\pi}{6} \quad \text{given } 0 \le x \le 2\pi.\end{aligned}$$

Question 11 (e)

Criteria	Marks
• Provides correct solution	2
• Rewrites as $\frac{dx}{dy} = e^{-2y}$, or equivalent merit	1

Sample answer:

$$\frac{dy}{dx} = e^{2y}$$

$$\frac{dx}{dy} = e^{-2y}$$

$$x = \int e^{-2y}\,dy$$

$$= -\frac{1}{2}e^{-2y} + C$$

Question 12 (a)

Criteria	Marks
• Provides correct solution	3
• Proves inductive step by assuming true for k (or equivalent) and using that assumption to show true for $k + 1$, or equivalent merit	2
• Verifies base case, $n = 1$, or equivalent merit	1

Sample answer:

$$(1\times 2)+(2\times 5)+(3\times 8)+\cdots+n(3n-1)=n^2(n+1)$$

For $n = 1$ LHS $= 1\,(2)$ $= 2$ RHS $= 1\,(2)$ $= 2$

$\therefore$ Statement is true for $n = 1$

Assume statement true for $n = k$, that is,

$$(1\times 2)+(2\times 5)+(3\times 8)+\cdots+k(3k-1)=k^2(k+1)$$

Prove true for $n = k + 1$

That is, we show that

$$(1\times 2)+(2\times 5)+\cdots+k(3k-1)+(k+1)\big(3(k+1)-1\big)=(k+1)^2(k+2)$$

$$\begin{aligned}\text{LHS} &= k^2(k+1)+(k+1)(3k+2)\\ &= \big(k+1\big)\big(k^2+3k+2\big)\\ &= (k+1)(k+1)(k+2)\\ &= (k+1)^2(k+2)\\ &= \text{RHS}\end{aligned}$$

$\therefore$ By the principle of mathematical induction the statement is true for $n \geq 1$.

Question 12 (b) (i)

Criteria	Marks
• Provides correct answer	1

Sample answer:

$$\begin{aligned} E(X) &= np \\ &= 100 \times \frac{3}{5} \\ &= 60 \end{aligned}$$

Question 12 (b) (ii)

Criteria	Marks
• Provides correct solution	1

Sample answer:

$$\begin{aligned} \sigma &= \sqrt{np(1-p)} \\ &= \sqrt{100 \times \frac{3}{5} \times \frac{2}{5}} \\ &= \sqrt{24} \\ &\doteqdot 5 \end{aligned}$$

Question 12 (b) (iii)

Criteria	Marks
• Provides correct solution	1

Sample answer:

$$\begin{aligned} P(55 \le X \le 65) &= P(-1 \le Z \le 1) \\ &\simeq 68\% \end{aligned}$$

Question 12 (c)

Criteria	Marks
• Provides correct explanation	2
• Evaluates $\binom{8}{3}$, or obtains the expression $\dfrac{400}{\binom{8}{3}}$, or equivalent merit	1

Sample answer:

There are $\binom{8}{3} = 56$ possible choices of 3 topics and $\dfrac{400}{56} = 7.14.$

As there are 56 possible combinations, we can have at most 392 students without exceeding 7 students per combination. But we have 400 students, so at least one combination has 8 or more students.

Question 12 (d)

Criteria	Marks
• Provides correct solution	3
• Finds correct primitive, or equivalent merit	2
• Uses product to sum result, or equivalent merit	1

Sample answer:

$$\int_0^{\frac{\pi}{2}} \cos 5x \sin 3x \, dx = \int_0^{\frac{\pi}{2}} \frac{1}{2}(\sin 8x - \sin 2x)\, dx$$

$$= \left[\frac{1}{2}\left(-\frac{\cos 8x}{8} + \frac{\cos 2x}{2}\right)\right]_0^{\frac{\pi}{2}}$$

$$= \frac{1}{2}\left(-\frac{1}{8} - \frac{1}{2}\right) - \frac{1}{2}\left(-\frac{1}{8} + \frac{1}{2}\right)$$

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

Question 12 (e)

Criteria	Marks
• Provides correct solution	3
• Obtains $x^2 + y^2 =$ constant, or equivalent merit	2
• Separates the variable, or equivalent merit	1

Sample answer:

$$\frac{dy}{dx} = \frac{-x}{y}$$

Separating variables, $\int y\,dy = \int -x\,dx$

$$\therefore \qquad \frac{y^2}{2} = \frac{-x^2}{2} + c$$

$$x^2 + y^2 = d, \text{ where } d = 2c$$

The curve passes through (1, 0)

So $d = 1^2 + 0^2 = 1$

Hence the equation of D is

$$x^2 + y^2 = 1 \qquad \text{(unit circle)}$$

Question 13 (a) (i)

Criteria	Marks
• Provides correct derivative	1

Sample answer:

$$\frac{d}{d\theta}\left(\sin^3\theta\right) = 3\sin^2\theta\cos\theta$$

Question 13 (a) (ii)

Criteria	Marks
• Provides correct solution	4
• Obtains correctly simplified integrand in terms of $\sin\theta$ and $\cos\theta$, or equivalent merit	3
• Correctly substitutes and attempts to simplify (ignoring limits), or equivalent merit	2
• Uses given substitution, or equivalent merit	1

Sample answer:

Let $x = \tan\theta$

$$\frac{dx}{d\theta} = \sec^2\theta$$

At $x = 0$, $\theta = 0$

at $x = 1$, $\theta = \frac{\pi}{4}$

$$\therefore \int_0^1 \frac{x^2}{\left(1+x^2\right)^{\frac{5}{2}}}\,dx = \int_0^{\frac{\pi}{4}} \frac{\tan^2\theta}{\left(1+\tan^2\theta\right)^{\frac{5}{2}}}\sec^2\theta\,d\theta$$

$$= \int_0^{\frac{\pi}{4}} \frac{\tan^2\theta}{\sec^3\theta}\,d\theta$$

$$= \int_0^{\frac{\pi}{4}} \frac{\sin^2\theta}{\cos^2\theta}\cos^3\theta\,d\theta$$

$$= \int_0^{\frac{\pi}{4}} \sin^2\theta\cos\theta\,d\theta$$

$$= \left[\frac{1}{3}\sin^3\theta\right]_0^{\frac{\pi}{4}} \qquad \text{by part (i)}$$

$$= \frac{1}{3}\times\left(\frac{\sqrt{2}}{2}\right)^3$$

$$= \frac{2\sqrt{2}}{3\times 2^3}$$

$$= \frac{\sqrt{2}}{12}$$

Question 13 (b)

Criteria	Marks
• Provides correct solution	4
• Obtains a correct expression for the volume and uses a double-angle formula, or equivalent merit	3
• Finds point of intersection and writes volume as a difference of volumes OR • Finds point of intersection and finds volume generated by $y = \sin x$, or equivalent merit	2
• Finds point of intersection, or writes volume as a difference of two volumes, or equivalent merit	1

Sample answer:

The curves intersect when

$$\begin{aligned}\cos 2x &= \sin x \\ 1 - 2\sin^2 x &= \sin x \\ 2\sin^2 x + \sin x - 1 &= 0\end{aligned}$$

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

$$\therefore \ \sin x = \frac{1}{2}, \ (\sin x \neq -1).$$

$$\therefore \ x = \frac{\pi}{6}$$

The volume is given by

$$\begin{aligned}V &= \pi \int_0^{\frac{\pi}{6}} \cos^2 2x \, dx - \pi \int_0^{\frac{\pi}{6}} \sin^2 x \, dx \\ &= \pi \left(\int_0^{\frac{\pi}{6}} \frac{1 + \cos 4x}{2} \, dx - \int_0^{\frac{\pi}{6}} \frac{1 - \cos 2x}{2} \, dx \right) \\ &= \pi \left[\frac{\sin 4x}{8} + \cancel{\frac{x}{2}} - \cancel{\frac{x}{2}} + \frac{\sin 2x}{4} \right]_0^{\frac{\pi}{6}} \\ &= \pi \left(\frac{\sin \frac{2\pi}{3}}{8} + \frac{\sin \frac{\pi}{3}}{4} \right) \\ &= \frac{\pi}{8} \left(\frac{\sqrt{3}}{2} + \sqrt{3} \right) \\ &= \frac{3\pi\sqrt{3}}{16}\end{aligned}$$

Question 13 (c) (i)

Criteria	Marks
• Provides correct solution	4
• Obtains one correct derivative and makes some progress towards obtaining the other, or equivalent merit	3
• Obtains one correct derivative or attempts both, or equivalent merit	2
• Attempts one derivative, or equivalent merit	1

Sample answer:

$$f'(x) = \sec^2\left(\cos^{-1} x\right) \cdot \frac{-1}{\sqrt{1-x^2}}$$

$$= \frac{1}{\cos^2\left(\cos^{-1} x\right)} \cdot \frac{-1}{\sqrt{1-x^2}}$$

$$= \frac{-1}{x^2\sqrt{1-x^2}}$$

$$g'(x) = \frac{-\frac{x}{\sqrt{1-x^2}} \times x - \sqrt{1-x^2} \times 1}{x^2}$$

$$= \frac{-\cancel{x^2} - \left(1 - \cancel{x^2}\right)}{x^2\sqrt{1-x^2}}$$

$$= \frac{-1}{x^2\sqrt{1-x^2}}$$

$$\therefore\ f'(x) = g'(x)$$

Question 13 (c) (ii)

Criteria	Marks
• Provides correct solution for both parts of the domain	3
• Provides a correct solution for one part of the domain, or equivalent merit	2
• Observes that $f(x)-g(x)$ is a constant, or equivalent merit	1

Sample answer:

$$f'(x)=\frac{-1}{x^2\sqrt{1-x^2}}=g'(x)$$

And so $f'(x)-g'(x)=0$

$\Rightarrow f(x)-g(x)$ is a constant

For $x<0$, say $x=-1$

$$f(-1)-g(-1)=\tan\left(\cos^{-1}(-1)\right)-\frac{\sqrt{1-(-1)^2}}{(-1)}$$

$$=\tan(\pi)+0$$

$$=0$$

So for $x<0$, $f(x)=g(x)$.

For $x>0$, say $x=1$,

$$f(1)-g(1)=\tan\left(\cos^{-1}(1)\right)-\frac{\sqrt{1-(1)^2}}{(1)}$$

$$=\tan(0)+0$$

$$=0$$

So for $x>0$, $f(x)=g(x)$

So for all x in the domain

$f(x)=g(x)$

Question 14 (a) (i)

Criteria	Marks
• Provides correct solution	2
• Identifies coefficient of x^n on the left hand side, or equivalent merit	1

Sample answer:

The left hand side is $\binom{2n}{n}$ which is the coefficient of x^n in the expansion of $(1+x)^{2n}$.

This means that $\binom{n}{0}\binom{n}{0}+\binom{n}{1}\binom{n}{1}+\cdots+\binom{n}{n}\binom{n}{n}$ should be the coefficient of x^n in the expansion of $(1+x)^n(1+x)^n$.

The first term, $\binom{n}{0}$ is the constant term in the expansion of $(1+x)^n$ and so should be multiplied by an x^n term. But $\binom{n}{0}=\binom{n}{n-0}=\binom{n}{n}$ is equal to the coefficient of x^n in the expansion $(1+x)^n$.

Thus $\binom{n}{0}^2$ is the coefficient of the x^n term that comes from the constant in the expansion of $(1+x)^n$ times the coefficient of the x^n term in the expansion of $(1+x)^n$.

Similarly $\binom{n}{1}^2$ is the coefficient of the x^n term that comes from the coefficient of x term in the expansion of $(1+x)^n$ times the coefficient of the x^{n-1} term in the expansion of $(1+x)^n$.

Therefore, the right hand side is the coefficient of the x^n term in the expansion of $(1+x)^n(1+x)^n$.

OR

Question 14 (a) (i) (continued)

The coefficient of x^n in expansion of $(1+x)^{2n}$ is $\binom{2n}{n}$.

The coefficient of x^n in $(1+x)^n(1+x)^n$ is

$$=\binom{n}{0}\binom{n}{n}+\binom{n}{1}\binom{n}{n-1}+\cdots+\binom{n}{k}\binom{n}{n-k}+\cdots+\binom{n}{n}\binom{n}{0}$$

But $\binom{n}{n-k}=\binom{n}{k}$

So the coefficient is $\binom{n}{0}\binom{n}{0}+\binom{n}{1}\binom{n}{1}+\cdots+\binom{n}{n}\binom{n}{n}$

Hence $\binom{2n}{n}=\binom{n}{0}^2+\binom{n}{1}^2+\cdots+\binom{n}{n}^2$

Question 14 (a) (ii)

Criteria	Marks
• Provides correct solution	2
• Explains why one of the terms is $\binom{n}{k}\times\binom{n}{k}$, or equivalent merit	1

Sample answer:

We can choose:

0 men and 0 women in $\binom{n}{0}\binom{n}{0}=\binom{n}{0}^2$ ways

or 1 man and 1 woman in $\binom{n}{1}^2$ ways

$\vdots$

or n men and n women in $\binom{n}{n}^2$ ways

Hence the total number of ways is

$$\binom{n}{0}^2+\cdots+\binom{n}{n}^2=\binom{2n}{n} \qquad \text{from part (i)}$$

Question 14 (a) (iii)

Criteria	Marks
• Provides correct solution	2
• Explains why one of the terms is $k^2\binom{n}{k}^2$, or equivalent merit	1

Sample answer:

We can choose 1 woman and 1 leader in $\binom{n}{1}\times 1$ ways and similarly for the men. This gives

$\binom{n}{1}\times 1\times\binom{n}{1}\times 1=\binom{n}{1}^2\times 1^2$ for this case.

We can choose 2 women and 1 leader in $\binom{n}{2}\binom{2}{1}=\binom{n}{2}\times 2$ ways and similarly for the men.

This gives $\binom{n}{2}\times 2\times\binom{n}{2}\times 2=\binom{n}{2}^2\times 2^2$ for this case.

$$\vdots$$

We can choose n women and 1 leader in $\binom{n}{n}\binom{n}{1}=\binom{n}{n}\times n$ ways and similarly for the men.

This gives $\binom{n}{n}\times n\times\binom{n}{n}\times n=\binom{n}{n}^2\times n^2$ for this case.

And so the total is $1^2\binom{n}{1}^2+2^2\binom{n}{2}^2+\cdots+n^2\binom{n}{n}^2$.

Question 14 (a) (iv)

Criteria	Marks
• Provides correct solution	2
• Recognises that choosing the leaders first reduces the problem to using part (ii) with $n - 1$ women and $n - 1$ men, or equivalent merit	1

Sample answer:

There are n ways to choose a woman leader, leaving $(n - 1)$ women from which to choose.

There are n ways to choose a man leader, leaving $(n - 1)$ men from which to choose.

By part (ii) there are $\binom{2(n-1)}{(n-1)}$ ways to choose the $(n - 1)$ women and $(n - 1)$ men.

Hence $1^2\binom{n}{1}^2 + 2^2\binom{n}{2}^2 + \cdots + n^2\binom{n}{n}^2 = n^2\binom{2n-2}{n-1}$.

Question 14 (b) (i)

Criteria	Marks
• Provides correct solution	2
• Expands $\sin(2\theta + \theta)$, or equivalent merit	1

Sample answer:

$$\begin{aligned}
\sin 3\theta &= \sin(2\theta + \theta) \\
&= \sin 2\theta \cos\theta + \cos 2\theta \sin\theta \\
&= 2\sin\theta \cos^2\theta + \left(1 - 2\sin^2\theta\right)\sin\theta \\
&= 2\sin\theta\left(1 - \sin^2\theta\right) + \sin\theta - 2\sin^3\theta \\
&= 3\sin\theta - 4\sin^3\theta
\end{aligned}$$

$$\therefore 4\sin^3\theta - 3\sin\theta + \sin(3\theta) = 0$$

$$\therefore \sin^3\theta - \frac{3}{4}\sin\theta + \frac{\sin(3\theta)}{4} = 0$$

Question 14 (b) (ii)

Criteria	Marks
• Provides correct solution	2
• Obtains $\sin^3\theta - \frac{3}{4}\sin\theta + \frac{8}{64} = 0$, or equivalent merit	1

Sample answer:

$$x^3 - 12x + 8 = 0$$

$$x = 4\sin\theta, \text{ so}$$

$$64\sin^3\theta - 48\sin\theta + 8 = 0$$

$$\therefore \sin^3\theta - \frac{3}{4}\sin\theta + \frac{8}{64} = 0$$

comparing with (i),

$$\frac{8}{64} = \frac{\sin 3\theta}{4} \quad \Rightarrow \quad \sin 3\theta = \frac{32}{64} = \frac{1}{2}.$$

Question 14 (b) (iii)

Criteria	Marks
• Provides correct proof	3
• Obtains all the roots of the cubic, or equivalent merit	2
• Obtains $4\sin\frac{\pi}{18}$ as a solution of the cubic in part (b) (ii), or equivalent merit	1

Sample answer:

From $\quad \sin 3\theta = \frac{1}{2}$

we have $\quad 3\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{\pi}{6} + 2\pi, \frac{5\pi}{6} + 2\pi, \frac{\pi}{6} + 4\pi, \ldots$

$$\theta = \frac{\pi}{18}, \frac{5\pi}{18}, \frac{13\pi}{18}, \frac{17\pi}{18}, \frac{25\pi}{18}, \ldots$$

So $4\sin\frac{\pi}{18},\ 4\sin\frac{5\pi}{18},\ 4\sin\frac{13\pi}{18}$ etc are roots of the cubic, but they are not all distinct.

The angles $\frac{\pi}{18}$ and $\frac{5\pi}{18}$ are distinct angles in the first quadrant and so have different positive sine values. The angle $\frac{25\pi}{18}$ is in the third quadrant and so has a negative sine value. Hence we can take $\alpha = 4\sin\frac{\pi}{18},\ \beta = 4\sin\frac{5\pi}{18},\ \gamma = 4\sin\frac{25\pi}{18}$ as 3 distinct roots,

Now $\quad \alpha^2 + \beta^2 + \gamma^2 = (\alpha + \beta + \gamma)^2 - 2(\alpha\beta + \alpha\gamma + \beta\gamma)$

$$= 0^2 + 2 \times 12$$

$$= 24$$

$$\therefore\ 16\left(\sin^2\frac{\pi}{18} + \sin^2\frac{5\pi}{18} + \sin^2\frac{25\pi}{18}\right) = 24$$

$$\therefore\ \sin^2\frac{\pi}{18} + \sin^2\frac{5\pi}{18} + \sin^2\frac{25\pi}{18} = \frac{24}{16} = \frac{3}{2}.$$

2020 HSC Mathematics Extension 1 Mapping Grid

Section I

Question	Marks	Content	Syllabus outcomes
1	1	ME-F1 Further Work with Functions	ME11–2
2	1	ME-F1 Further Work with Functions	ME11–1
3	1	ME-C2 Further Calculus Skills	ME12–1
4	1	ME-V1 Introduction to Vectors	ME12–2
5	1	ME-F2 Polynomials	ME11–1
6	1	ME-V1 Introduction to Vectors	ME12–2
7	1	ME-C3 Applications of Calculus	ME12–4
8	1	ME-A1 Working with Combinatorics	ME11–5
9	1	ME-V1 Introduction to Vectors	ME12–2
10	1	ME-C1 Rates of Change	ME11–4

Section II

Question	Marks	Content	Syllabus outcomes
11 (a) (i)	1	ME-F2 Polynomials	ME11–2
11 (a) (ii)	2	ME-F2 Polynomials	ME11–2
11 (b)	3	ME-V1 Introduction to Vectors	ME12–2
11 (c)	3	ME-F1 Further Work with Functions	ME11–2
11 (d)	4	ME-T3 Trigonometric Equations	ME12–3
11 (e)	2	ME-C3 Applications of Calculus	ME12–4
12 (a)	3	ME-P1 Proof by Mathematical Induction	ME12–1
12 (b) (i)	1	ME-S1 The Binomial Distribution	ME12–5
12 (b) (ii)	1	ME-S1 The Binomial Distribution	ME12–5
12 (b) (iii)	1	ME-S1 The Binomial Distribution	ME12–5
12 (c)	2	ME-A1 Working with Combinatorics	ME11–5, ME12-7
12 (d)	3	ME-T2 Further Trigonometric Identities ME-C2 Further Calculus Skills	ME12–1
12 (e)	3	ME-C3 Applications of Calculus	ME12–4
13 (a) (i)	1	ME-C2 Further Calculus Skills	ME12–1

Question	Marks	Content	Syllabus outcomes
13 (a) (ii)	4	ME-C2 Further Calculus Skills	ME12–1
13 (b)	4	ME-C3 Applications of Calculus	ME12–4
13 (c) (i)	4	ME-C2 Further Calculus Skills	ME12–4
13 (c) (ii)	3	ME-C2 Further Calculus Skills	ME12–4, ME 12 -7
14 (a) (i)	2	ME-A1 Working with Combinatorics	ME11–5
14 (a) (ii)	2	ME-A1 Working with Combinatorics	ME11–5
14 (a) (iii)	2	ME-A1 Working with Combinatorics	ME11–5
14 (a) (iv)	2	ME-A1 Working with Combinatorics	ME11–5
14 (b) (i)	2	ME-T3 Trigonometric Equations	ME12–3
14 (b) (ii)	2	ME-T3 Trigonometric Equations	ME12–3
14 (b) (iii)	3	ME-F2 Polynomials ME-T3 Trigonometric Equations	ME12–3