Exercise MTH 10102

1. Find the value of $\int\left(\frac{e^{\sqrt{x}}}{\sqrt{x}}+2^{x+1}\right)dx$

2. Find the value of $\int \sin^6 x\cos^3 x\,dx$

3. Find the value of $\int \cot^5 x\csc^3 x\,dx$

4. Find the value of $\int_0^5 |2x-5|\,dx$

5. Find the value of $\int x^3\cos\left(x^4-10\right)dx$

6. Find the value of $\int\sqrt{1+\sqrt{1+x}}\,dx$

7. Find the value of $\int\frac{x}{x^2-8x+20}dx$

8. Find the value of c such that $\int_{-1}^{c}\left|2-x^2\right|dx=\frac{1+8\sqrt{2}}{3}$, where $c>\sqrt{2}$

9. Find the value of $\int_0^{15}\frac{1}{1+\sqrt[4]{x+1}}dx$

10. Find the value of $\int 2x\sin\left(2x\right)dx$

11. Find the value of $\int\cos\left(\ln x\right)dx$

12. Find the value of $\int\frac{3x+5}{x^3-x^2-x+1}dx$

13. Find the value of $\int\frac{8x^2-10x+3}{\left(x-4\right)\left(x^2+1\right)}dx$

14. Find the area enclosed by the curve $y=e^{3x+2}$, $x=-2$, $x-axis$ and $y-axis$

15. Find the area enclosed by the curve $y=x^3+x^2-2x$ and $x-axis$

16. Find the area enclosed by the curve $y=x^2$, $y=-3x+4$ and $x-axis$

17. Find the value of $\int_0^2\frac{x}{\left(x^2-1\right)^2}dx$ and consider whether it is a convergent or divergent integral. If it converges, what value does it converge to?

18. Find the value of $\int_0^{+\infty} \frac{1}{\sqrt{x+2x^2+x^3}}dx$ and consider whether it is a convergent or divergent integral. If it converges, what value does it converge to?

19. Use the trapezoidal rule to estimate the value of $\int_{0.0}^{2.0} f(x)\,dx$ with $n=4$, given than $f(x)$ as shown in the following table.

x	0.0	0.5	1.0	1.5	2.0
$f(x)$	1.8	2.4	1.6	1.2	0.4

20. Use Simpson's rule to estimate the value of $\int_{0.0}^{3.2} xf(x)\,dx$ with $n=4$, given that $f(x)$ as shown in the following

x	0.0	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2
$f(x)$	2.8	2.5	2.3	2.4	2.1	3.6	0.4	0.8	0.0