UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION

FEBRUARY 2025 SEMESTER SESSION

SUBJECT CODE	:	**LEB11503**
SUBJECT TITLE	:	**ENGINEERING MATHEMATICS 2**
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	:	**BACHELOR OF ELECTRICAL AND ELECTRONICS ENGINEERING TECHNOLOGY (MARINE) WITH HONOURS**
TIME / DURATION	:	**9.00 AM - 12.00PM** **(3 HOURS)**
DATE	:	**30 JUNE 2025**

INSTRUCTIONS TO CANDIDATES

1. Please read **CAREFULLY** the instructions given in the question paper.

2. This question paper has information printed on both sides of the paper.

3. Answer ONLY **FOUR (4)** questions.

4. Please write your answers on this answer booklet provided.

5. Answer **ALL** questions in English language **ONLY**.

6. Answer should be written in blue of black ink except for sketching, graphic and illustration.

7. Formula sheet has been appended for your reference.

THERE ARE 8 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

(Total: 100 marks)

INSTRUCTION: Answer ONLY FOUR (4) questions.

Question 1

With reference to Trigonometry and Differentiation:

(a) Prove the following trigonometric identities:

$$\frac{2}{\sqrt{\sec^2 \beta - 1}} = 2\cot \beta$$

(3 marks)

(b) Solve $4\sin y \cos y = 3\sin y$ for $0^0 \le y < 360^0$.

(7 marks)

(c) Given the equation $4x^2 + \frac{2y}{x+1} + 5y = 3$. Determine $\frac{dy}{dx}$ in terms of x and y.

(5 marks)

(d) A thin metal disk with circle shaped is burn and its radius expands at the rate of 0.01 cm/second. When the radius is 50 cm, calculate the rate of change of:

   i. surface area of the disk

(6 marks)

   ii. circumference of the disk.

(4 marks)

Question 2

With reference to Trigonometry and Differentiation:

(a) Given $\sin A = \frac{3}{5}$ and $\cos B = -\frac{8}{10}$ where A and B are in second quadrant. Estimate:

   i. $\sin 2B$.

(2 marks)

   ii. $\cos(A+B)$.

(4 marks)

(b)   Prove the following trigonometric identities:

$$sec\,A - cos\,A = sin\,A\,tan\,A$$

(4 marks)

(c)   Figure 1 shows an open-topped cuboid-shaped water tank which is made of sheet metal. The base of the tank is a rectangle x metres by y metres. The height of of the tank is x metres. The capacity of the tank is 100 m³.
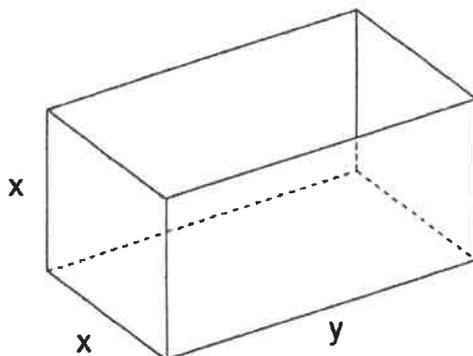

Figure 1: Water Tank

i.   Show that the area A m^2 of the sheet metal used to make the tank is given by

$$A = \frac{300}{x} + 2x^2.$$

(5 marks)

ii.   Estimate the value of x for which A is stationary.

(3 marks)

iii.   Justify that the value of x in ii. gives a minimum value of A.

(2 marks)

(d)   Calculate y' when $x = 1$ for $y = \left(\frac{3x+2}{x}\right)\left(x^{-5} + 1\right)$.

(5 marks)

Question 3

With reference to Geometry and Integration;

(a)   Figure 2 shows a sphere, cone and cube. The surface area of the sphere is equal to the sum of the surface areas of the cone and cube.
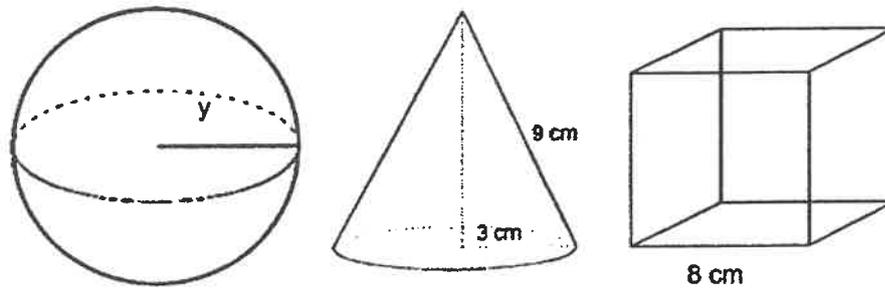

Figure 2: Sphere, Cone and Cube

i.   Estimate the value of y.

(7 marks)

ii.   Hence, calculate the volume of sphere. Give your answer to 1 decimal place.

(3 marks)

(b)   Find the integration of $\int \dfrac{5x-4}{2x^2+x-1}dx$ by using partial fraction method.

(10 marks)

(c)   Evaluate $\int \dfrac{6}{(4x+10)^4}dx$ with respect to x. (Give your answers in the simplest form).

(5 marks)

Question 4

With reference to Geometry and Integration:

(a) The circumference of a buoy on a ship is 4π meters. If an arc of length 2 meters is cut out from the circumference, estimate the:

    i.   radius of the buoy,

(3 marks)

    ii.   the central angle of the remaining sector, in degrees and minutes.

(7 marks)

(b) Determine the value of k, given that $\int_0^1 \dfrac{(x-k)}{(3x+1)(x+1)}\,dx = 0$.

(15 marks)

Question 5

With reference to Geometry and Integration:

(a) Figure 3 below shows a rectangle ABCD and a circle. BC is the diameter of the circle. Calculate the area of the rectangle that is shaded.
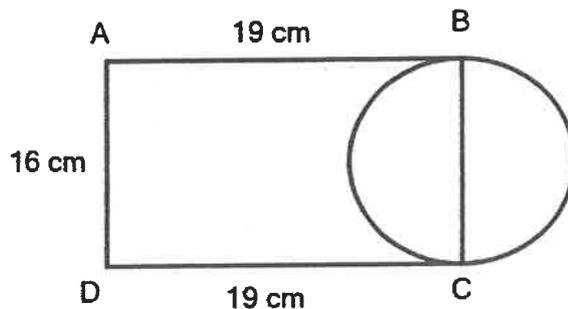
(5 marks)

Figure 3: Rectangle ABCD and Circle

(b)   The diagonal of a rectangular field is 50 m and one of the sides is 40 m. If the cost of cutting the grass of the field is RM 27 per square metre, compute the total cost of cutting all grass of the rectangular field.

(5 marks)

(c)   Figure 4 shows the region enclosed by the line $y = x + 1$ and the curve $y = x^2 - 2x + 1$.

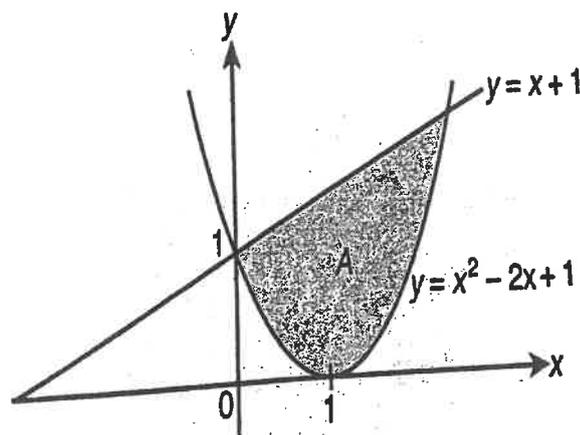Figure 4 : Shaded Region A

Compute:

i.   the point of intersect of the curve and line.

(6 marks)

ii.   the area of the shaded region A enclosed by the curve and line.

(4 marks)

(d)   Given $f(x) = \sqrt{4 + x^3}$. Calculate the definite integral. $\int_0^3 f(x)\, dx$ when the number of intervals is 6, use the Trapezoidal rule and give your answer correct to FOUR (4) significant figures.

(5 marks)

Question 6

With reference to Trigonometry and Differentiation:

(a)   Given that $\tan\theta = \dfrac{4}{3}$ where $270^0 < \theta < 360^0$ and $\sin\beta = -\dfrac{12}{13}$ where $270^0 < \beta < 360^0$. Calculate the value of each of the following trigonometric functions without using a calculator.

i. $\sin 2\beta$.

(2 marks)

ii. $\tan\left(\dfrac{\theta}{2}\right)$.

(3 marks)

iii. $\cos(\theta + \beta)$.

(3 marks)

iv. $\sec(\theta + \beta)$.

(2 marks)

(b)   Determine $f''\left(\dfrac{\pi}{4}\right)$ if $f(x) = \sec x$.

(5 marks)

(c)   Ship A is travelling due west toward Lighthouse Rock at a speed of 15 kilometers per hour (km/hr). Ship B is travelling due north away from Lighthouse Rock at a speed of 10 km/hr. Let x be the distance between Ship A and Lighthouse Rock at time t, and let y be the distance between Ship B and Lighthouse Rock at time t, as shown in Figure 5 below.
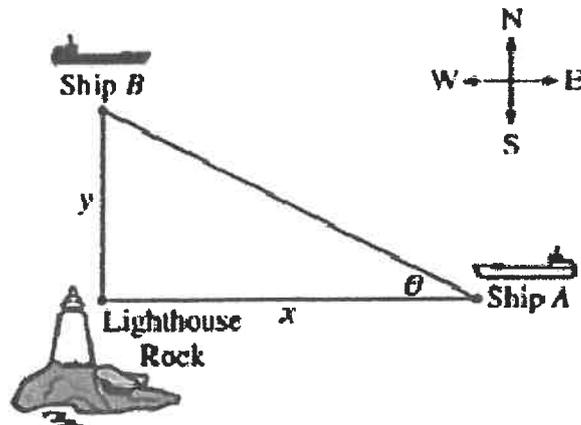
Figure 5: Location of Ship A, B and Lighthouse Rock

i. Find the distance, in kilometers, between Ship A and Ship B when $x = 4\,\text{km}$ and $y = 3\,\text{km}$.

(2 marks)

ii. Find the rate of change, in km/hr, of the distance between the two ships when $x = 4\,\text{km}$ and $y = 3\,\text{km}$.

(4 marks)

iii. Let θ be the angle shown in Figure 5. Compute the rate of change of θ, in radians per hour, when $x = 4\,\text{km}$ and $y = 3\,\text{km}$.

(4 marks)

END OF EXAMINATION PAPER

TRIGONOMETRY IDENTITIES

FUNDAMENTAL IDENTITIES	FORMULAS FOR NEGATIVES
$\csc\theta = \dfrac{1}{\sin\theta}$	$\sin(-\theta) = -\sin\theta$
$\sec\theta = \dfrac{1}{\cos\theta}$	$\cos(-\theta) = \cos\theta$
$\cot\theta = \dfrac{1}{\tan\theta} = \dfrac{\cos\theta}{\sin\theta}$	$\tan(-\theta) = -\tan\theta$
$\cos^2\theta = \dfrac{1}{2}(1 + \cos 2\theta)$	$\csc(-\theta) = -\csc\theta$
$\sin^2\theta + \cos^2\theta = 1$	$\sec(-\theta) = \sec\theta$
$1 + \tan^2\theta = \sec^2\theta$	$\cot(-\theta) = -\cot\theta$
$1 + \cot^2\theta = \csc^2\theta$	$\sin^2\theta = \dfrac{1}{2}(1 - \cos 2\theta)$

ADDITION FORMULAS	SUBTRACTION FORMULAS
$\sin(A+B) = \sin A\cos B + \cos A\sin B$	$\sin(A-B) = \sin A\cos B - \cos A\sin B$
$\cos(A+B) = \cos A\cos B - \sin A\sin B$	$\cos(A-B) = \cos A\cos B + \sin A\sin B$
$\tan(A+B) = \dfrac{\tan A + \tan B}{1 - \tan A\tan B}$	$\tan(A-B) = \dfrac{\tan A - \tan B}{1 + \tan A\tan B}$

HALF-ANGLE FORMULAS	DOUBLE-ANGLE FORMULAS
$\sin\dfrac{\theta}{2} = \pm\sqrt{\dfrac{1-\cos\theta}{2}}$	$\sin 2\theta = 2\sin\theta\cos\theta$
$\cos\dfrac{\theta}{2} = \pm\sqrt{\dfrac{1+\cos\theta}{2}}$	$\cos 2\theta = \cos^2\theta - \sin^2\theta$ $\dots\dots = 1 - 2\sin^2\theta$ $\dots\dots = 2\cos^2\theta - 1$
$\tan\dfrac{\theta}{2} = \dfrac{1-\cos\theta}{\sin\theta} = \dfrac{\sin\theta}{1+\cos\theta}$	$\tan 2\theta = \dfrac{2\tan\theta}{1 - \tan^2\theta}$

PRODUCT-TO-SUM FORMULAS	SUM-TO-PRODUCT FORMULAS
$\sin\alpha\cos\beta = \dfrac{1}{2}\left[\sin(\alpha+\beta) + \sin(\alpha-\beta)\right]$	$\sin\alpha + \sin\beta = 2\sin\dfrac{\alpha+\beta}{2}\cos\dfrac{\alpha-\beta}{2}$
$\cos\alpha\sin\beta = \dfrac{1}{2}\left[\sin(\alpha+\beta) - \sin(\alpha-\beta)\right]$	$\sin\alpha - \sin\beta = 2\cos\dfrac{\alpha+\beta}{2}\sin\dfrac{\alpha-\beta}{2}$
$\cos\alpha\cos\beta = \dfrac{1}{2}\left[\cos(\alpha+\beta) + \cos(\alpha-\beta)\right]$	$\cos\alpha + \cos\beta = 2\cos\dfrac{\alpha+\beta}{2}\cos\dfrac{\alpha-\beta}{2}$

HYPERBOLIC FUNCTION	
$\sinh\theta = \dfrac{e^x - e^{-x}}{2}$	$\cosh\theta = \dfrac{e^x + e^{-x}}{2}$

DIFFERENTIATION

STANDARD FORM	GENERAL FORM
$\dfrac{d}{dx}(\sin x) = \cos x$	$\dfrac{d}{dx}(\sin f(x)) = f'(x)\cos f(x)$
$\dfrac{d}{dx}(\cos x) = -\sin x$	$\dfrac{d}{dx}(\cos f(x)) = -f'(x)\sin f(x)$
$\dfrac{d}{dx}(\tan x) = \sec^2 x$	$\dfrac{d}{dx}(\tan f(x)) = f'(x)\sec^2 f(x)$
$\dfrac{d}{dx}(\csc x) = -\csc x \cot x$	$\dfrac{d}{dx}(\csc f(x)) = -f'(x)\csc f(x)\cot f(x)$
$\dfrac{d}{dx}(\sec x) = \sec x \tan x$	$\dfrac{d}{dx}(\sec f(x)) = f'(x)\sec f(x)\tan f(x)$
$\dfrac{d}{dx}(\cot x) = -\csc^2 x$	$\dfrac{d}{dx}(\cot f(x)) = -f'(x)\csc^2 f(x)$

EXPONENTIAL FUNCTION

STANDARD FORM	GENERAL FORM
$\dfrac{d}{dx}e^x = e^x$	$\dfrac{d}{dx}e^{f(x)} = f'(x)e^{f(x)}$

LOGARITHMIC FUNCTION

STANDARD FORM	GENERAL FORM
$\dfrac{d}{dx}\ln x = \dfrac{1}{x}$	$\dfrac{d}{dx}\ln f(x) = \dfrac{f'(x)}{f(x)}$

DIFFERENTIATION OF INVERSE TRIGONOMETRY FUNCTION

GENERAL FORM
$\dfrac{d}{dx}\left[\sin^{-1}(f(x))\right] = \dfrac{1}{\sqrt{1-(f(x))^2}} \bullet (f'(x))$
$\dfrac{d}{dx}\left[\cos^{-1}(f(x))\right] = \dfrac{-1}{\sqrt{1-(f(x))^2}} \bullet (f'(x))$
$\dfrac{d}{dx}\left[\tan^{-1}(f(x))\right] = \dfrac{1}{1+(f(x))^2} \bullet (f'(x))$
$\dfrac{d}{dx}\left[\cot^{-1}(f(x))\right] = \dfrac{-1}{1-(f(x))^2} \bullet (f'(x))$
$\dfrac{d}{dx}\left[\sec^{-1}(f(x))\right] = \dfrac{1}{(f(x))\sqrt{(f(x))^2-1}} \bullet (f'(x))$
$\dfrac{d}{dx}\left[\csc^{-1}(f(x))\right] = \dfrac{-1}{(f(x))\sqrt{(f(x))^2-1}} \bullet (f'(x))$

DIFFERENTIATION OF HYPERBOLIC FUNCTION

GENERAL FORM
$\dfrac{d}{dx}\left[\sinh(f(x))\right] = (\cosh f(x)) \bullet (f'(x))$
$\dfrac{d}{dx}\left[\cosh(f(x))\right] = (\sinh f(x)) \bullet (f'(x))$
$\dfrac{d}{dx}\left[\tanh(f(x))\right] = (\operatorname{sec}h^2 f(x)) \bullet (f'(x))$
$\dfrac{d}{dx}\left[\coth(f(x))\right] = (-\csc^2 f(x)) \bullet (f'(x))$
$\dfrac{d}{dx}\left[\operatorname{sec}h(f(x))\right] = (-\operatorname{sec}h f(x))(\tanh f(x)) \bullet (f'(x))$
$\dfrac{d}{dx}\left[\csc(f(x))\right] = (-\csc f(x))(\coth f(x)) \bullet (f'(x))$

INTEGRATION

STANDARD FORM	GENERAL FORM [Where: $f(x) = ax + b$]
$\int \cos x\, dx = \sin x + c$	$\int \cos f(x)\, dx = \dfrac{\sin f(x)}{f'(x)} + c$
$\int \sin x\, dx = -\cos x + c$	$\int \sin f(x)\, dx = \dfrac{-\cos f(x)}{f'(x)} + c$
$\int \sec^2 x\, dx = \tan x + c$	$\int \sec^2 f(x)\, dx = \dfrac{\tan f(x)}{f'(x)} + c$
$\int \sec x \tan x\, dx = \sec x + c$	$\int \sec f(x) \tan f(x)\, dx = \dfrac{\sec f(x)}{f'(x)} + c$
$\int \csc x \cot x\, dx = -\csc x + c$	$\int \csc f(x) \cot f(x)\, dx = \dfrac{-\csc f(x)}{f'(x)} + c$
$\int \csc^2 x\, dx = -\cot x + c$	$\int \csc^2 f(x)\, dx = \dfrac{-\cot f(x)}{f'(x)} + c$
$\int \tan x\, dx = \ln|\sec x| + c$	$\int \tan x\, dx = \dfrac{\ln|\sec f(x)|}{f'(x)} + c$
$\int \sec x\, dx = \ln|\sec x + \tan x| + c$	$\int \sec x\, dx = \dfrac{\ln|\sec f(x) + \tan f(x)|}{f'(x)} + c$
$\int \cot x\, dx = \ln|\sin x| + c$	$\int \cot x\, dx = \dfrac{\ln|\sin f(x)|}{f'(x)} + c$
$\int \csc x\, dx = -\ln|\csc x + \cot x| + c$	$\int \csc x\, dx = \dfrac{-\ln|\csc f(x) + \cot f(x)|}{f'(x)} + c$

EXPONENTIAL FUNCTION

STANDARD FORM	GENERAL FORM [Where: $f(x) = ax + b$]
$\int e^x\, dx = e^x + c$	$\int e^{f(x)}\, dx = \dfrac{e^{f(x)}}{f'(x)} + c$

LOGARITHMIC FUNCTION

STANDARD FORM	GENERAL FORM [Where: $f(x) = ax + b$]
$\int \dfrac{1}{x}\, dx = \ln|x| + c$	$\int \dfrac{1}{f(x)}\, dx = \dfrac{\ln|f(x)|}{f'(x)} + c$

APPROXIMATE INTEGRATION

Trapezoidal rule: Area $= \dfrac{h}{2}\left[y_0 + y_n + 2(y_1 + y_2 + \dots + y_{n-1}) \right]$
Simpson's rule: Area $= \dfrac{h}{3}\left[y_0 + 4y_1 + 2y_2 + 4y_3 + 2y_4 + \dots + y_n \right]$
Mid ordinate rule: Area $= h \sum y_n$

ORDINARY DIFFERENTIAL EQUATIONS FORMULAE

Real and different roots: $y = Ae^{m_1 x} + Be^{m_2 x}$
Real and same roots: $y = (A + Bx)e^{mx}$
Complex roots: $y = e^{\alpha x}(A \cos \beta x + B \sin \beta x)$

FORM OF PARTICULAR INTEGRAL FOR DIFFERENT FUNCTIONS

Type	Straightforward cases	Snag cases
a) $f(x) =$ a constant	$v = k$	$v = kx$ (used when C.F contains a constant)
b) $f(x) =$ polynomial (i.e. $f(x) = L + Mx + Nx^2 + \ldots$ where any of the coefficients may be zero)	$v = a + bx + cx^2 + \ldots$	
c) $f(x) =$ an exponential function (i.e. $f(x) = Ae^{ax}$)	$v = ke^{ax}$	i. $v = kxe^{ax}$ (used when e^{ax} appears in the C.F) ii. $v = kx^2 e^{ax}$ (used when e^{ax} and xe^{ax} both appears in the C.F)
d) $f(x) =$ a sine or cosine function (i.e. $f(x) = a\sin px + b\cos px$ where a or b may be zero)	$v = A\sin px + B\cos px$	$v = x(A\sin px + B\cos px)$ (used when $\sin px$ and/or $\cos px$ appears in the C.F)
e) $f(x) =$ a sum e.g. i. $f(x) = 4x^2 - 3\sin 2x$ ii. $f(x) = 2 - x + e^{3x}$	i. $v = ax^2 + bx + c$ $+ d\sin 2x + e\cos 2x$ ii. $v = ax + b + ce^{3x}$	
f) $f(x) =$ a product e.g. $f(x) = 2e^x \cos 2x$	$v = e^x(A\sin 2x + B\cos 2x)$	

STATISTICS

Mean for grouped data, $\bar{x} = \dfrac{\sum fx}{n}$

Median for grouped data,

$$= L_m + \left(\dfrac{\dfrac{n}{2} - F}{f_m} \right) i$$

Where:
$L_m =$ lower boundary of class median
$f_m =$ the frequency of class median
$i =$ class width
$F =$ the cumulative frequency before class median
$n =$ the total frequency

$$Q_1 = L_{Q_1} + \left(\dfrac{\dfrac{n}{4} - F}{f_{Q_1}} \right) i \ , \qquad Q_3 = L_{Q_{31}} + \left(\dfrac{\dfrac{3n}{2} - F}{f_{Q_3}} \right) i$$

Mode for grouped data $= L_{mo} + \left(\dfrac{\Delta_1}{\Delta_1 + \Delta_2} \right) i$

Where:

Δ_1 is the difference between the frequency of class mode and the frequency of the class before the class mode,

Δ_2 is the difference between the frequency of class mode and the frequency of the class before the class mode

Population Variance for ungrouped data, $\sigma^2 = \dfrac{1}{N}\Sigma(x - \mu)^2$ or $= \dfrac{1}{N}\Sigma(x^2 - \mu^2)$

Population Variance for grouped data, $\sigma^2 = \dfrac{1}{N}\Sigma f(x - \mu)^2$ or $= \dfrac{1}{N}\Sigma f(x^2 - \mu^2)$

Sample Variance of ungrouped data $= \dfrac{\Sigma(x - \bar{x})^2}{n - 1}$

Sample Variance of grouped data $= \dfrac{\Sigma fx^2 - \dfrac{(\Sigma fx)^2}{n}}{n - 1}$ or $= \dfrac{\Sigma f(x - \bar{x})^2}{n - 1}$

Population Standard Deviation, $\sigma = \sqrt{\sigma^2}$

Sample Standard Deviation, $s = \sqrt{s^2}$

Coefficient of variation, $CV = \dfrac{\text{sample standard deviation}}{\text{standard mean}} \times 100$

TABLE OF LAPLACE TRANSFORM

$f(t)=\mathcal{L}^{-1}\{F(s)\}$	$F(s)=\mathcal{L}\{f(t)\}$	$f(t)=\mathcal{L}^{-1}\{F(s)\}$	$F(s)=\mathcal{L}\{f(t)\}$
1. 1	$\dfrac{1}{s}$	2. e^{at}	$\dfrac{1}{s-a}$
3. $t^n,\ n=1,2,3,\ldots$	$\dfrac{n!}{s^{n+1}}$	4. $t^p,\ p>-1$	$\dfrac{\Gamma(p+1)}{s^{p+1}}$
5. $\sqrt{t}$	$\dfrac{\sqrt{\pi}}{2s^{\frac{3}{2}}}$	6. $t^{n-\frac{1}{2}},\ n=1,2,3,\ldots$	$\dfrac{1\cdot3\cdot5\cdots(2n-1)\sqrt{\pi}}{2^n s^{n+\frac{1}{2}}}$
7. $\sin(at)$	$\dfrac{a}{s^2+a^2}$	8. $\cos(at)$	$\dfrac{s}{s^2+a^2}$
9. $t\sin(at)$	$\dfrac{2as}{\left(s^2+a^2\right)^2}$	10. $t\cos(at)$	$\dfrac{s^2-a^2}{\left(s^2+a^2\right)^2}$
11. $\sin(at)-at\cos(at)$	$\dfrac{2a^3}{\left(s^2+a^2\right)^2}$	12. $\sin(at)+at\cos(at)$	$\dfrac{2as^2}{\left(s^2+a^2\right)^2}$
13. $\cos(at)-at\sin(at)$	$\dfrac{s\left(s^2-a^2\right)}{\left(s^2+a^2\right)^2}$	14. $\cos(at)+at\sin(at)$	$\dfrac{s\left(s^2+3a^2\right)}{\left(s^2+a^2\right)^2}$
15. $\sin(at+b)$	$\dfrac{s\sin(b)+a\cos(b)}{s^2+a^2}$	16. $\cos(at+b)$	$\dfrac{s\cos(b)-a\sin(b)}{s^2+a^2}$
17. $\sinh(at)$	$\dfrac{a}{s^2-a^2}$	18. $\cosh(at)$	$\dfrac{s}{s^2-a^2}$
19. $e^{at}\sin(bt)$	$\dfrac{b}{(s-a)^2+b^2}$	20. $e^{at}\cos(bt)$	$\dfrac{s-a}{(s-a)^2+b^2}$
21. $e^{at}\sinh(bt)$	$\dfrac{b}{(s-a)^2-b^2}$	22. $e^{at}\cosh(bt)$	$\dfrac{s-a}{(s-a)^2-b^2}$
23. $t^n e^{at},\ n=1,2,3,\ldots$	$\dfrac{n!}{(s-a)^{n+1}}$	24. $f(ct)$	$\dfrac{1}{c}F\left(\dfrac{s}{c}\right)$
25. $u_c(t)=u(t-c)$ Heaviside Function	$\dfrac{e^{-cs}}{s}$	26. $\delta(t-c)$ Dirac Delta Function	e^{-cs}
27. $u_c(t)f(t-c)$	$e^{-cs}F(s)$	28. $u_c(t)g(t)$	$e^{-cs}\mathcal{L}\{g(t+c)\}$
29. $e^{ct}f(t)$	$F(s-c)$	30. $t^n f(t),\ n=1,2,3,\ldots$	$(-1)^n F^{(n)}(s)$
31. $\dfrac{1}{t}f(t)$	$\displaystyle\int_s^\infty F(u)\,du$	32. $\displaystyle\int_0^t f(v)\,dv$	$\dfrac{F(s)}{s}$
33. $\displaystyle\int_0^t f(t-\tau)g(\tau)\,d\tau$	$F(s)G(s)$	34. $f(t+T)=f(t)$	$\dfrac{\displaystyle\int_0^T e^{-st}f(t)\,dt}{1-e^{-sT}}$
35. $f'(t)$	$sF(s)-f(0)$	36. $f''(t)$	$s^2F(s)-sf(0)-f'(0)$
37. $f^{(n)}(t)$	$s^n F(s)-s^{n-1}f(0)-s^{n-2}f'(0)\cdots-sf^{(n-2)}(0)-f^{(n-1)}(0)$		