



# MATHS

## BOOKS - CENGAGE MATHS (HINGLISH)

### CURVE TRACING

#### Illustrations

1. Draw the graph of  $y = x - \sin x$



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2. Draw the graph of  $y = 2 \cos x + \sin 2x$

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3. Draw the graph of  $y = \sin x \cos^2 x$

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4. Draw the graph of

$$f(x) = x \cos x - \sin x, x \in [-3\pi, 3\pi]$$

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5. Draw the graph of the function

$$f(x) = x - \sqrt{x}.$$



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6. Draw the graph of  $y = \frac{x^2}{\sqrt{x+1}}$



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7. Draw the graph of  $x^{2/3}y^{2/3} = 1$



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8. Draw the graph of

$$y = (x + 1)^{2/3} + (x - 1)^{2/3}$$



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9. Draw the graph of  $y = e^x + e^{-2x}$



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**10.** Draw the graph of  $y = xe^x$ . Find the range of the function. Also find the point of inflection.



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**11.** Draw the graph of  $f(x) = x^2 e^{-|x|}$

i) Find the point of maxima/minima.

ii) Find the asymptote is any.

iii) Find the range of the function.

iv) Find the number of roots of the equation

$$f(x) = 1$$



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**12.** Find the minimum integral value of  $k$  for which the equation  $e^x = kx^2$  has exactly three real distinct solutions.



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**13.** Draw the graph of the function

$$f(x) = \left(\frac{1}{x}\right)^x$$



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**14.** Draw the graph of the function

$$f(x) = \left(1 + \frac{1}{x}\right)^2$$



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15. Discuss the number of roots of the equation  $e(k - x \log x) = 1$  for different value of  $k$ .



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16. Draw the graph of  $f(x) = \log_e \left( \sqrt{1 - x^2} - x \right)$



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17. Draw the graph of  $f(x) = \ln(1 - \ln x)$ .

Find the point of inflection.



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18. Draw the graph of the function

$$f(x) = 2x^2 - \log_e|x|$$



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19. Draw the graph of  $y = \log_e(x^3 - x)$



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20. Draw the graph of  $f(x) = \sqrt{1 - e^{-x^2}}$



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21. Draw the graph of the relation

$$y^2 = x^2(1 - x)$$



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22. Draw the graph of the relation

$$4y^2 = x^2(4 - x^2)$$



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23. Draw the graph of the relation

$$(y - x)^2 = x^3$$



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24. Draw the graph of  $y = x^{3/5}$



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25. Draw the graph of  $y = x^{2/5}$



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26. Draw and discuss the graph of

$$f(x) = x^{2/3} - x^{4/3}$$



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27. Draw the graph of  $f(x) = 12x^{\frac{4}{3}} - 6x^{\frac{1}{3}}$



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28. Draw the graph of the relation

$$y^2(x - 1) = x^2(1 + x)$$



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29. Draw the graph of  $y = \sqrt{\frac{1-x}{1+x}}$ .



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## Exercise

1. Draw the graph of  $y = \sin^2 x - \cos x$



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2. Draw and discuss the graph of

$$f(x) = x + \sqrt{x-1}$$



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3. Draw the graph of  $y = \sqrt{1 + x^2} - x$



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4. Draw the graph of

$$y = \left( \sqrt{x^2 + 1} - \sqrt{x^2 - 1} \right)$$



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5. Draw the graph of  $y = \frac{\sqrt{x}}{x - 1}$



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6. Draw the graph of the relation

$$y = |x|\sqrt{1 - x^2}$$



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7. Draw the graph of  $y = \sqrt{\frac{x - 1}{1 + x}}$



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8. Draw the graph of  $\sqrt{|x|} + \sqrt{|y|} = 1$





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9. Draw the graph of  $y = \frac{3\sqrt{x^2 + 1}}{x - 1}$



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10. Draw and discuss the graph of the function

$$f(x) = e^{1/x}$$



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11. Draw the graph of  $y = \frac{1}{\log_e x}$



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12. Draw the graph of  $y = \frac{1}{\log_e x}$



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13. Draw the graph of  $f(x) = e^{-x^2}$ . Discuss the concavity of the graph.



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14. Draw the graph of  $f(x) = \frac{e^x}{1 + e^x}$ . Also find the point of inflection.



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15. Draw the graph of the function  $f(x) = x^x$



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16. Draw the graph of  $y = x / \ln x$



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17. Draw the graph of  $y = (\log_e x)^2$



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18. Draw the graph of  $y = \log_e (x^2 - 1)$



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19. Draw and graph of  $f(x) = \frac{4 \log_e x}{x^2}$ . Also find the range.



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20. Draw the graph of the relation

$$y^2 = x^5(2 - x)$$



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21. Draw the graph of  $f(x) = 2x + 3x^{2/3}$  and discuss the type of non-differentiability for the function. Also find the point of inflection.



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22. The function  $f(x) = x^{1/3}(x - 1)$  has two inflection points has one point of extremum is non-differentiable has range  $\left[ -3x^{2^{-8/3}}, \infty \right)$



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23. Draw the graph of  $y = \frac{e^x - e^{-x}}{2}$ .



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24. Draw the graph of

$$y = \log_e \left( x + \sqrt{x^2 + 1} \right)$$



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