MATHS

BOOKS - MAXIMUM PUBLICATION

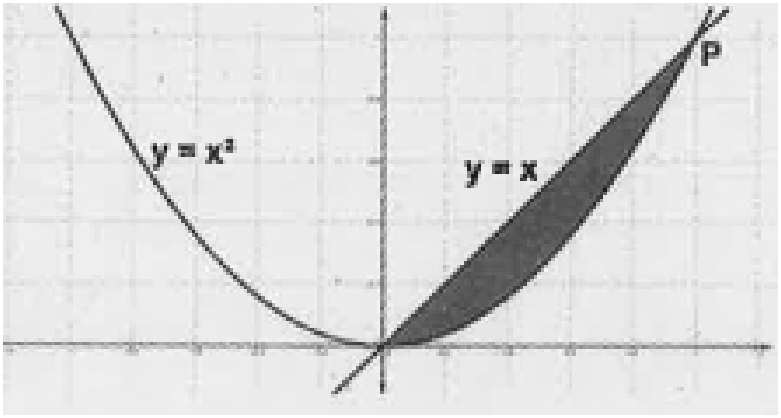
APPLICATION OF INTEGRALS

Example

1. Consider the following figure

find the point of intersection (P) of the

parabola and the line.



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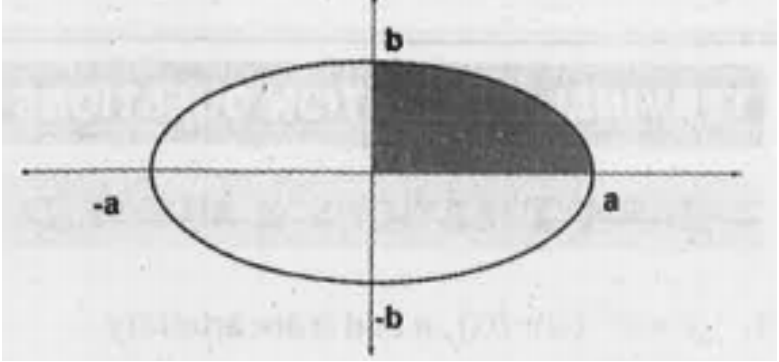
2. using the given figure

find the area of the enclosed region



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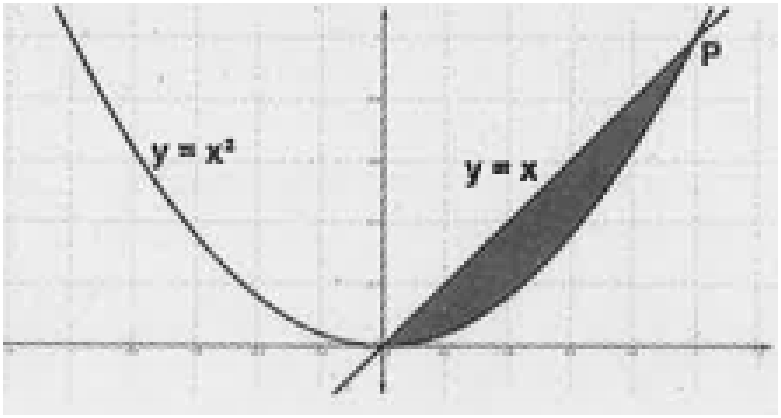
3. Consider the following figure

find the point of intersection (P) of the

parabola and the line.



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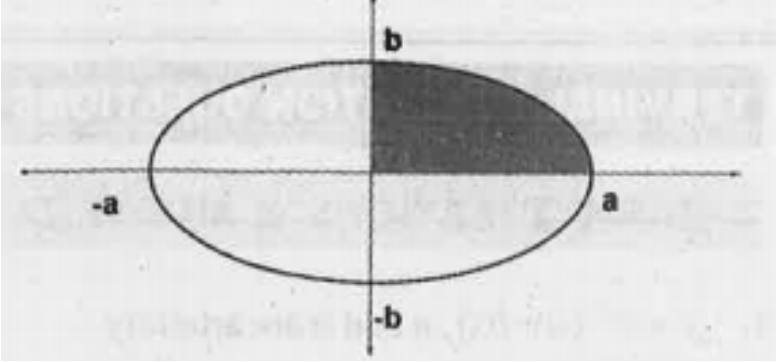
4. using the given figure

find the area of the enclosed region



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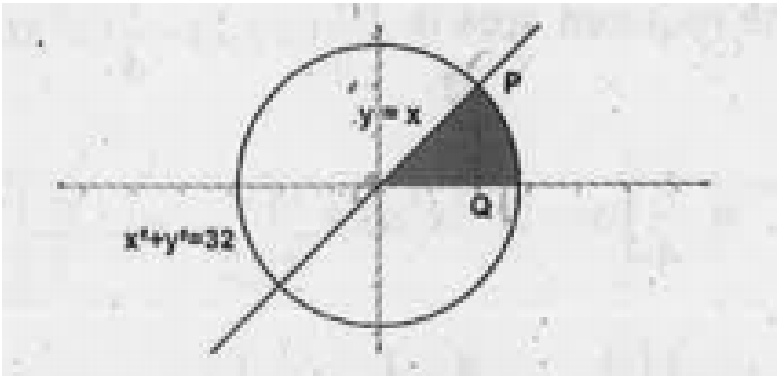
5. Consider the following figure

find the point of intersection P of the circle

$x^2 + y^2 = 32$

and the line $y = x$



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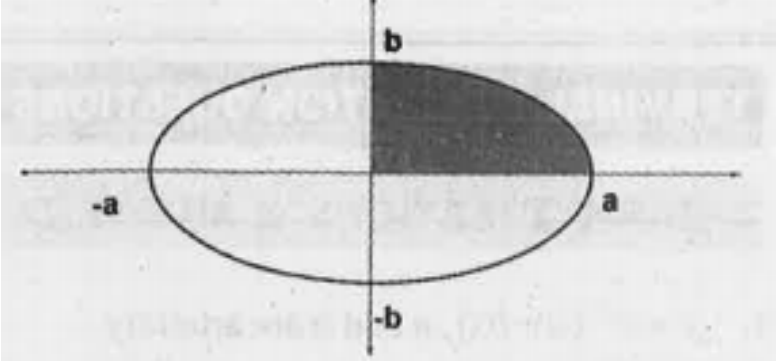
6. using the given figure

find the area of the enclosed region



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7. Shade the area enclosed by $x^2 = 4y, y = 2, y = 4$ and the y-axis in the first quadrant ?

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8. Find the area of the region bounded by

$x^2 = 4y, y = 2, y = 4$

and the y-axis in the first quadrant ?

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9. Draw a rough sketch of the graph of the function

$y^2 = 4x$

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10. Draw the graph of

$y^2 = 4x$

and y=x ?

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11. Find the points of intersection of $y^2 = 4x$

and y=x ?

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12. Draw the graph of the function $y = x^2$ and $x = y^2$ in a coordinate axis.

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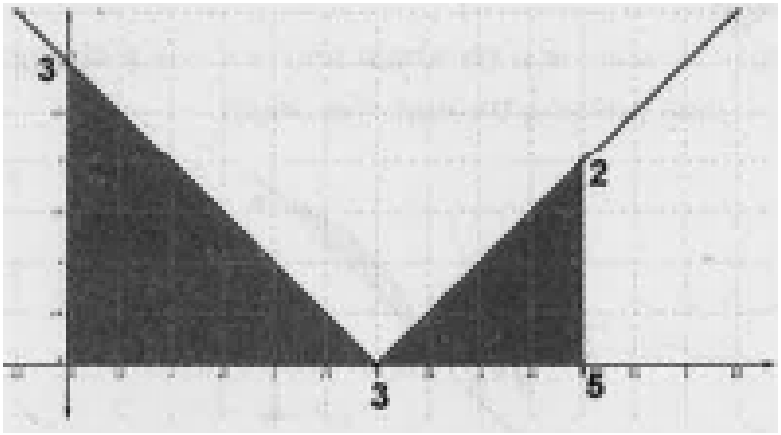
13. Using the figure

find the area of the shaded region as the sum

of the area of two triangles



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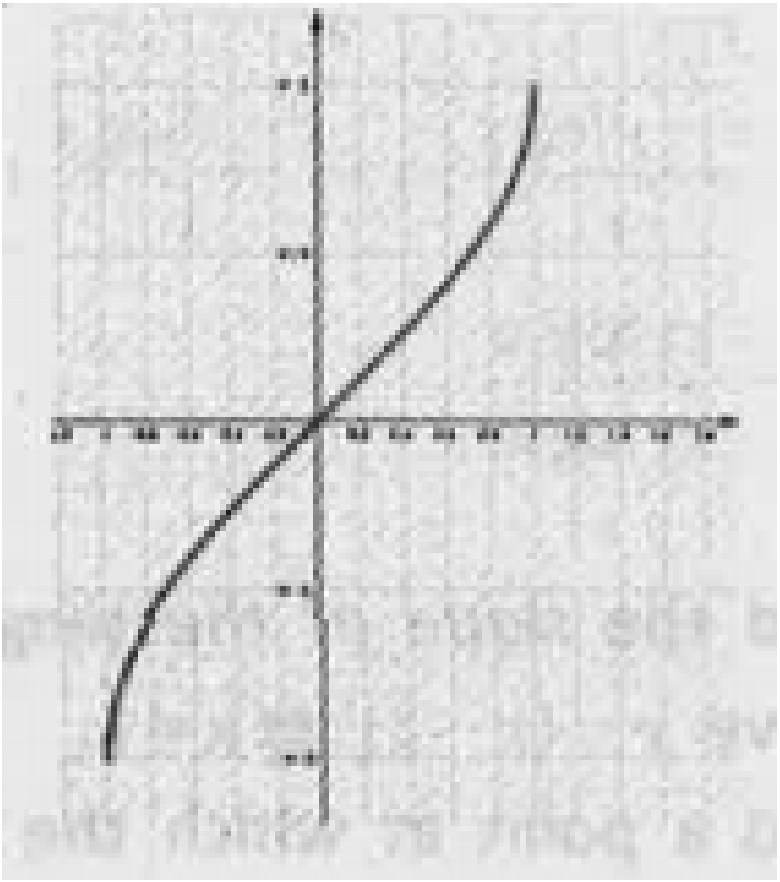
14. Identify the function from the above graph



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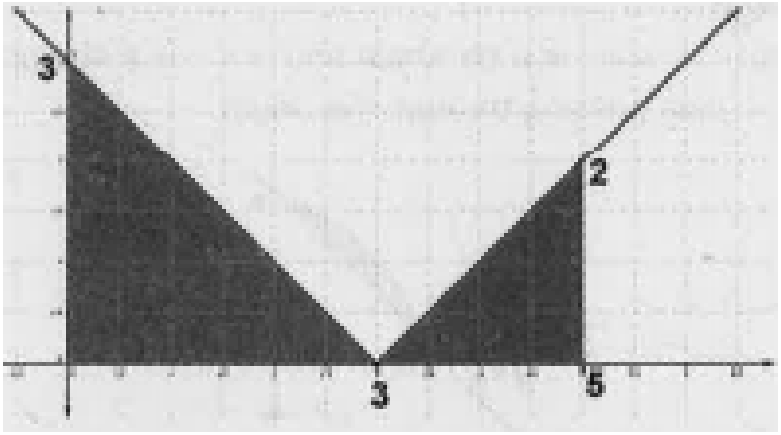
15. Using the figure

verify the area of the shaded region using integration



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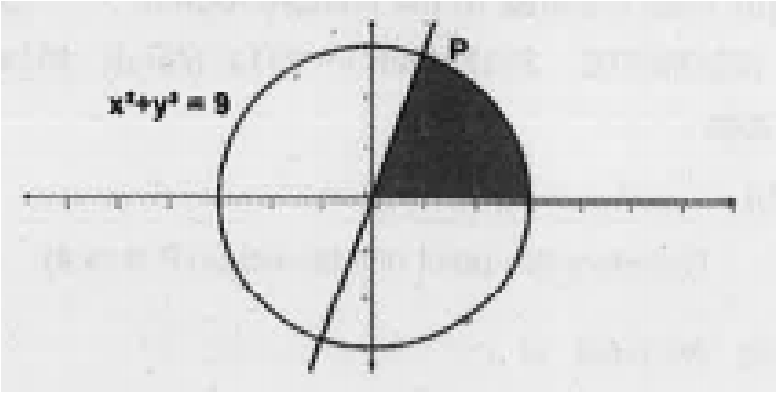
16. The figure given below contains a straight line L with a slope

$\sqrt{8}$

and a circle

Find the point of intersection P .



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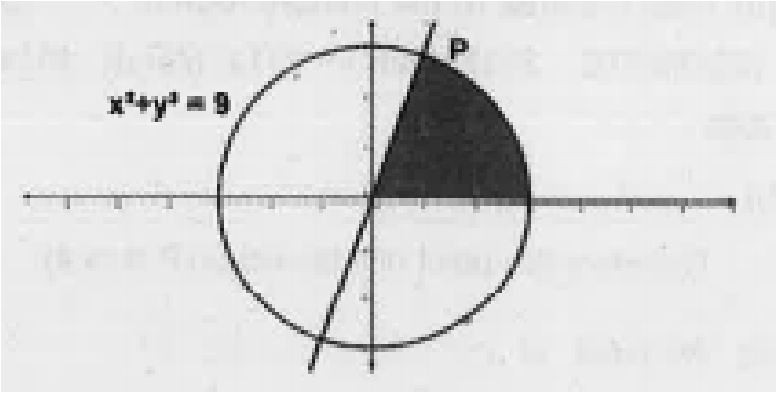
17. The figure given below contains a straight line L with a slope

$\sqrt{8}$

and a circle

Find the point of intersection P .



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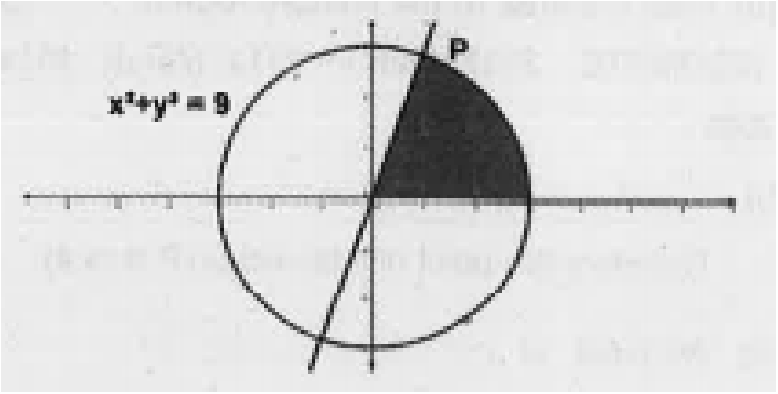
18. The figure given below contains a straight line L with a slope

$\sqrt{8}$

and a circle

Find the point of intersection P .



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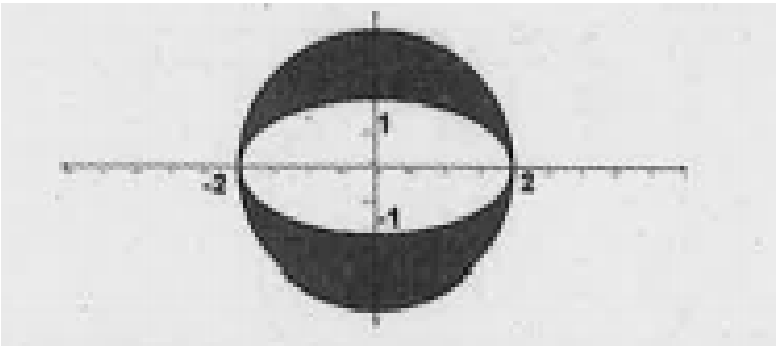
19. Using the given figure

Define the equation of the circle and ellipse in the figure .



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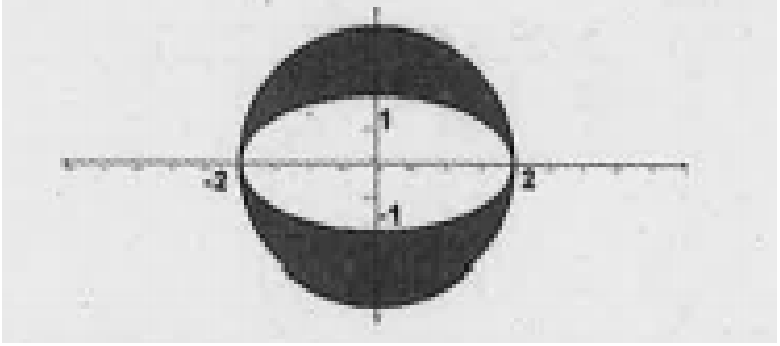
20. Using the given figure

find the area of the ellipse using integration



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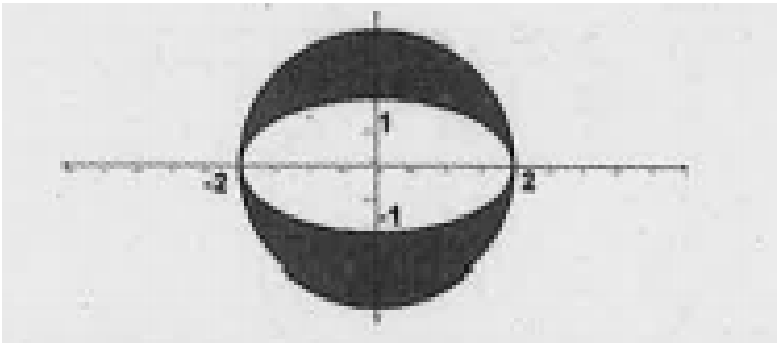
21. Using the given figure

find the area of the shaded region (using formula to find the area of the circle)



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22. Find the area bounded by the curve y= sin x with x-axis, between x=0 and $x = 2\pi$

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23. Find the area of the region bounded by the curve

$y = x^2$ and $y = |x|$

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24. Consider the functions $f(x) = \sin x$ and $g(x) = \cos x$ in the interval $[0, 2\pi]$ draw the rough sketch of the above function ?

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25. Consider the functions $f(x) = \sin x$ and $g(x) = \cos x$ in the interval $[0, 2\pi]$

find the area enclosed by these curves in the given interval ?

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26. Evaluate

$$\int_o^r \sqrt{r^2 - x^2} dx$$

,where r is a fixed positive number .Hence prove the area of the circle of radius r is πr^2

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27. Find the area of the circle ,

$x^2 + y^2 = 16$

which Is exterior to parabola

$y^2 = 6x$

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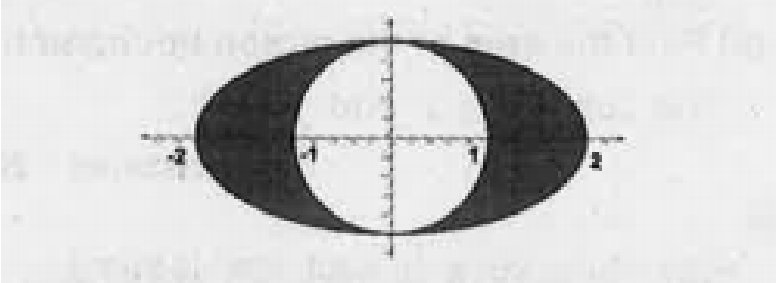
28. Using the figure

define the equation of ellipse and circle in the

given figure



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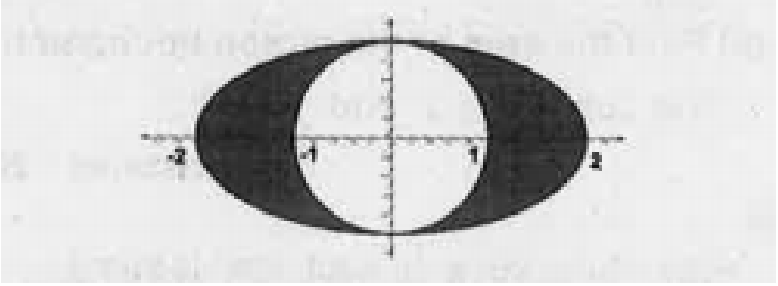
29. Using the figure

find the area of ellipse using integration



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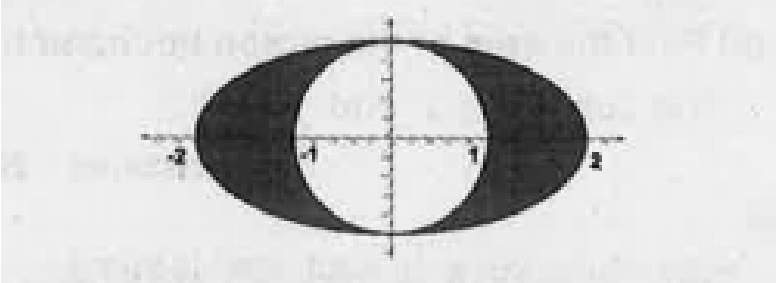
30. Using the figure

find the area of the shaded region(Area of the

circle can be found by direct formula)



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31. The area bounded by the curve y=f(x), x-axis and the line x=a and x=b is ?

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32. Find the area enclosed between parabola $y = x^2$ and the straight line 2x - y + 3 = 0

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33. Find the area enclosed between the curve

$x^2 = 4y$

and the line x = 4y - 2

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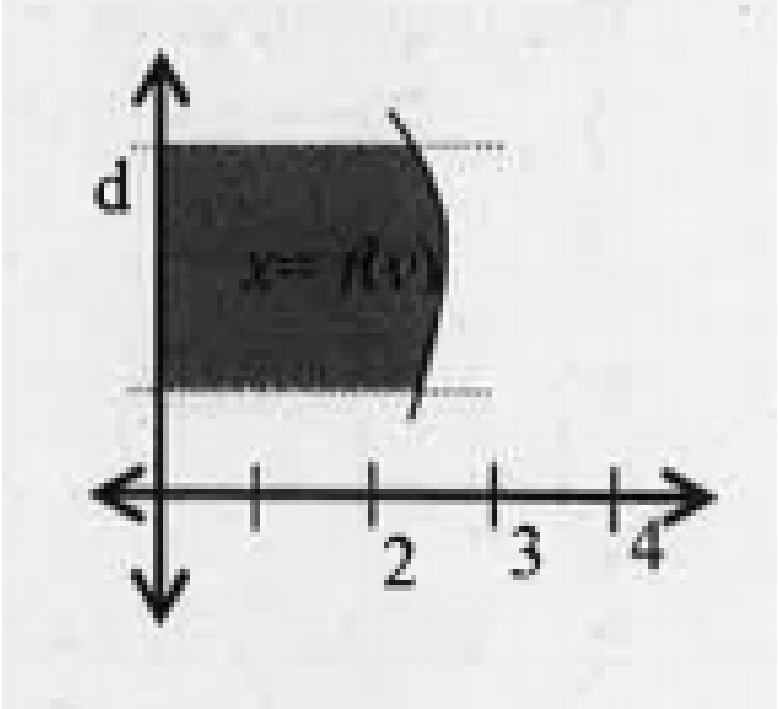
34. Area of the shaded portion in the figure is

equal to



A. $\int_d^c f(x)dx$

B. $\int_c^d f(x)dx$

C. $\int_d^c f(y)dx$

D. $\int_c^d f(y)dx$

Answer: D

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35. Consider the curves

$y = x^3$,x = 0,y = 1,y = 4

Draw a rough sketch and shade the region bounded by these curves, Find area of the shaded region

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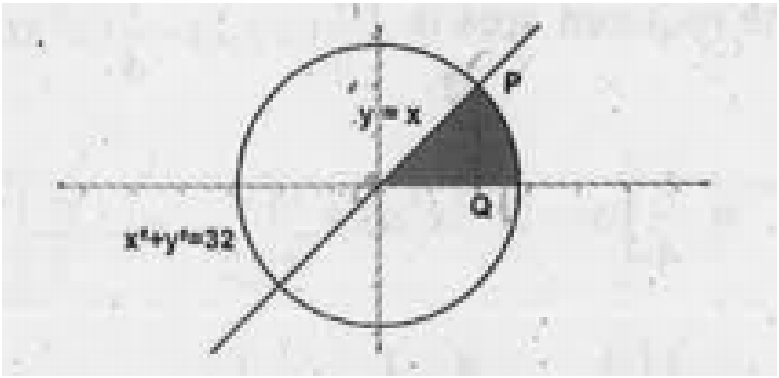
36. Consider the following figure

find the point of intersection P of the circle

$x^2 + y^2 = 32$

and the line $y = x$



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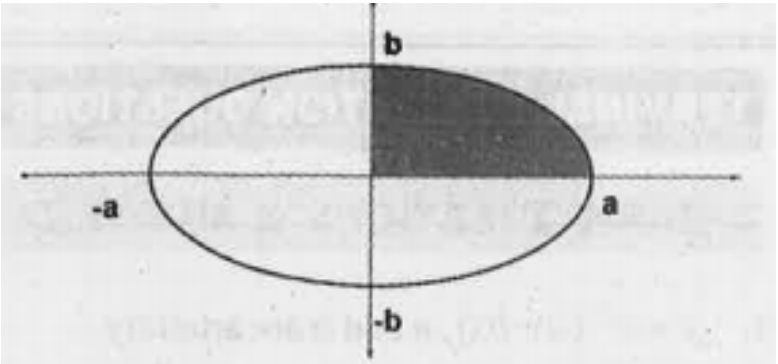
37. using the given figure

find the area of the enclosed region



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38. The area bounded by the curve above the x-axis, between $x = a$ and $x = b$ is

A. $\int_{f(a)}^{b} ydy$

B. $\int_{a}^{f(b)} ydy$

C. $\int_{a}^{b} xdy$

D. $\int_{a}^{b} ydx$

Answer: D

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39. Find the area of the circle

$x^2 + y^2 = 4$

using integration

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40. The area bounded by $y = 2\cos x$, the x-axis from x = 0 to $x = \frac{\pi}{2}$.a)0 b)1 c)2 d)-1

A. 0

B. 1

C. 2

D. -1

Answer: C

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41. Find the area of the region bounded by the

$y^2 = 4ax$ and $x^2 = 4ay$, a>0

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42. Consider the circle

$x^2 + y^2 = 16$

and the straight line

$y = \sqrt{3}x$

as shown in the figure

Find the points A and B as shown in the figure

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43. Consider the circle

$x^2 + y^2 = 16$

and the straight line

$y = \sqrt{3}x$

as shown in the figure

find the area of the shaded region in the figure using definite integrals 

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44. Draw the rough sketch of

$$\frac{x^2}{4} + \frac{y^2}{9} = 1$$

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45. Find the area enclosed between the curve

$$y^2 = x$$

, x=1,x=4 and x-axis

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46. Using integration, find the area of the region bounded by the triangle whose vertices are {1,0},{2,2} and {3,1}

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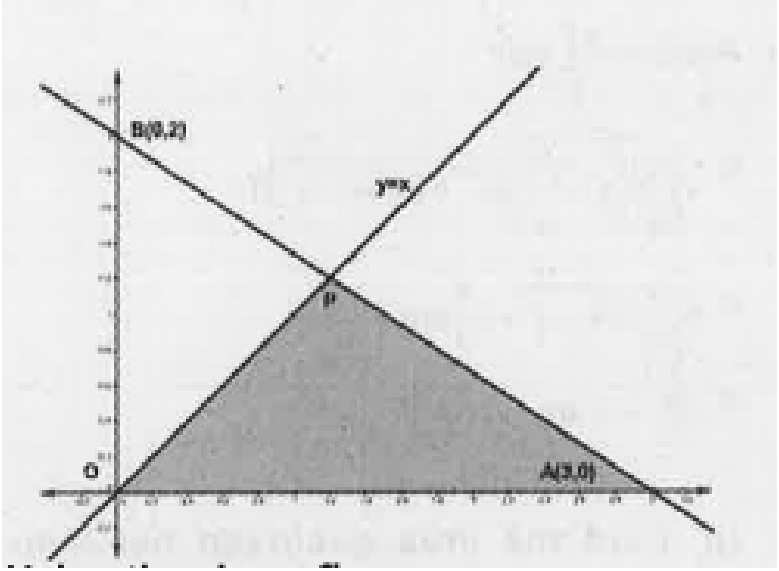
47. Using the given figure

Find the equation of AB



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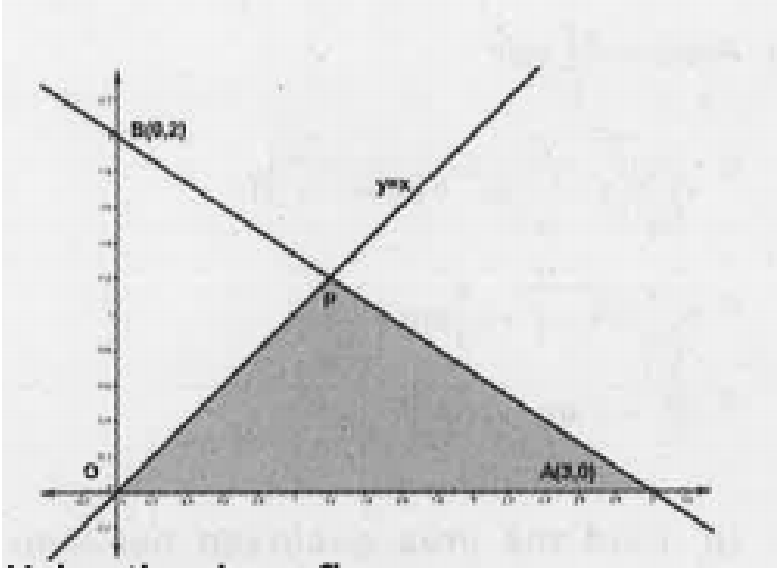
48. Using the given figure

Find the equation of AB



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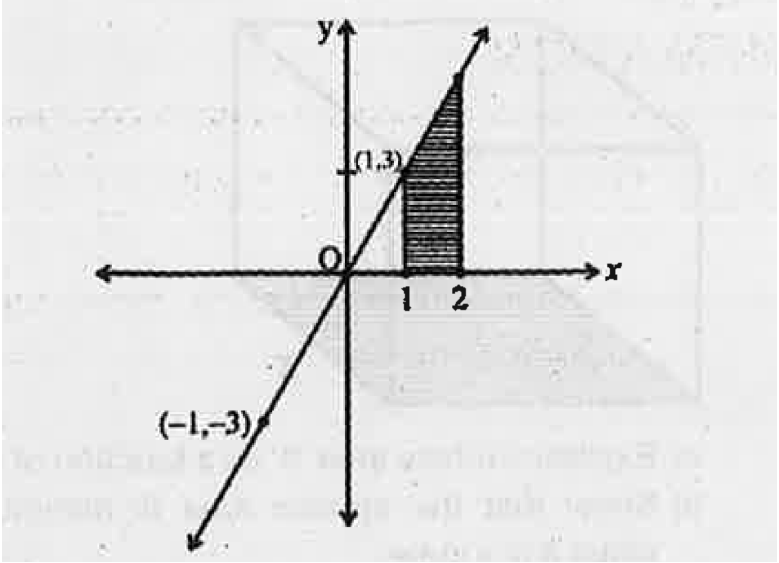
49. Find area of the shaded region using integration.



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50. Consider the ellipse

$$\frac{x^2}{9} + \frac{y^2}{4} = 1$$

and the line

$$\frac{x}{3} + \frac{y}{2} = 1$$

Find the points where the line intersects the ellipse ?

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51. Consider the ellipse

$$\frac{x^2}{9} + \frac{y^2}{4} = 1$$

and the line

$$\frac{x}{3} + \frac{y}{2} = 1$$

shade the smaller region bounded by the ellipse and the line ?

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52. Consider the ellipse

$$\frac{x^2}{9} + \frac{y^2}{4} = 1$$

and the line

$$\frac{x}{3} + \frac{y}{2} = 1$$

find the area of the shaded region ?

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53. Consider the function

$$f(x) = |x| - 1, g(x) = 1 - |x|$$

sketch the graph and shade the enclosed region between them

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54. Consider the function

$f(x) = |x| - 1, g(x) = 1 - |x|$

Find the area of the shaded region

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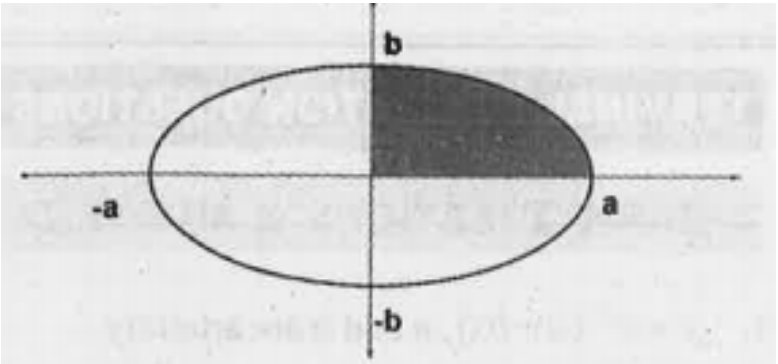
55. using the given figure

define the equation of the given curve



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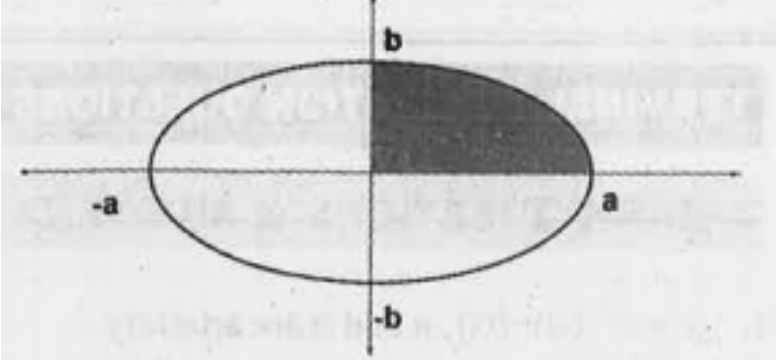
56. using the given figure

find the area of the enclosed region



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57. using the given figure

find the area when $a = 10$ and $b = 5$

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