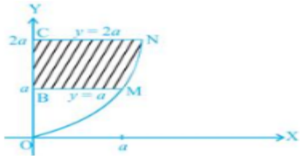
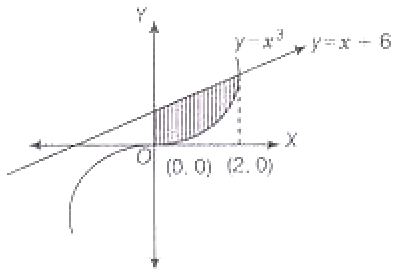
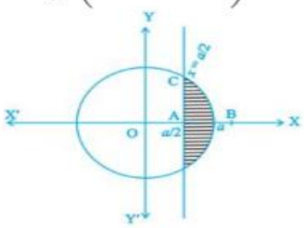
	ANSWER KEY XII(MATHS)
1	B
2	A
3	 We have Area BMNC $\int_0^{2a} x dy = \int_0^{2a} a^{1/3}y^{2/3}dy$ $= \frac{3a^{\frac{1}{3}}}{5}\left[y^{\frac{5}{3}}\right]_a^{2a}$ $= \frac{3a^{\frac{1}{3}}}{5}\left[(2a)^{\frac{5}{3}} - a^{\frac{5}{3}}\right]$ $= \frac{3}{5}a^{\frac{1}{3}}a^{\frac{5}{3}}\left[(2)^{\frac{5}{3}} - 1\right]$ $= \frac{3}{5}a^2\left[2.2^{\frac{2}{3}} - 1\right]$ sq units.
4	We have, $y = x^3$ and $y = x + 6$ and $x = 0$ $\therefore x^3 = x + 6$ $\Rightarrow x^3 - x = 6$ $\Rightarrow x^3 - x - 6 = 0$ $\Rightarrow x^2(x-2) + 2x(x-2) + 3(x-2) = 0$ $\Rightarrow (x-2)(x^2+2x+3) = 0$ $\Rightarrow x = 2$ with two imaginary points $\therefore$ Required area of shaded region $= \int_0^2 (x + 6 - x^3)dx$ $= \left[\frac{x^2}{2} + 6x - \frac{x^4}{4}\right]_0^2$ $= \left[\frac{4}{2} + 12 - \frac{16}{4} - 0\right]$ = [2 + 12 - 4] =10 sq.units 
5	Required Area $= 2\left[\frac{x}{2}\sqrt{a^2 - x^2} + \frac{a^2}{2}\sin^{-1}\frac{x}{2}\right]_{\frac{a}{2}}^{a}$ $= 2\left[\frac{a^2}{2}.\frac{\pi}{2} - \frac{a}{4}.a\frac{\sqrt{3}}{2} - \frac{a^2}{2}.\frac{\pi}{6}\right]$ $= \frac{a^2}{12}\left(6\pi - 3\sqrt{3} - 2\pi\right)$ $= \frac{a^2}{12}\left(4\pi - 3\sqrt{3}\right)$ sq units 

6

The equations of given curves are

$y=\frac{3}{4}x^2$............(1)}

and $3x-2y+12=0$ ....(2)

From (2), $2y=3x+12$

$\therefore\ y=\frac{3x+12}{2}$

putting this value of y in (1), we get

$\Rightarrow \frac{3x+12}{2}=\frac{3}{4}x^2$

$\Rightarrow 6x+24=3x^2$

$\Rightarrow x^2-2x-8=0$

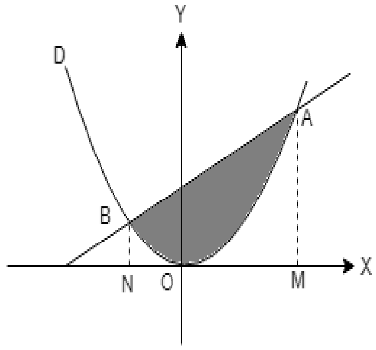
$\Rightarrow (x+2)(x-4)=0$

$\Rightarrow x=-2,4$

$\therefore\ y=3,12$

Thus, curves (1) and (2) intersect in points A(4,12) and B(-2,3).

Required area= 27 sq.units.



7

We have, y = 1 + |x + 1|, x = - 3, x = 3, y = 0

$$\therefore y=\begin{cases}-x, if\ x<-1\\ x+2,\ if x\geqslant -1\end{cases}$$

$\therefore$ Area of shaded region, $A=\int_{-3}^{-1}-xdx+\int_{-1}^{3}(x+2)dx$

$$=-\left[\frac{x^2}{2}\right]_{-3}^{-1}+\left[\frac{x^2}{2}+2x\right]_{-1}^{3}$$

$$=-\left[\frac{1}{2}-\frac{9}{2}\right]+\left[\frac{9}{2}+6-\frac{1}{2}+2\right]$$

$$=-[-4]+[8+4]$$

= 12 + 4 = 16 sq units