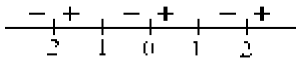
Level – 1	**Daily Tutorial Sheet - 6**

76.(B) $F(t)=\int_0^t e^{(t-y)}.y\,dy = e^t\int_0^t y e^{-y}dy = e^t\left[-e^{-y}(y+1)\right]_0^t = e^t\left[1-e^{-t}(t+1)\right] = e^t-(t+1)$

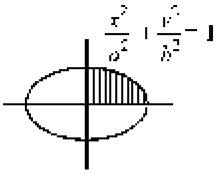
77.(D)

78.(ABCD) $f'(x)=\left(\dfrac{x^4-5x^2+4}{2+e^{x^2}}\right)2x = \dfrac{(x^2-1)(x^2-4)2x}{(2+e^{x^2})}\geq 0$

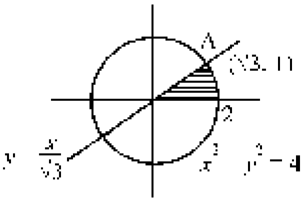


79.(ABD) $f(x)=\int_0^x |x-1|$ $f'(x) = |x-1|$ Continuous, Diff at $x = 2$, Continuous at $x = 1$

80.(C) $\dfrac{dx}{dt}=t\cdot\sec^2 t$; $\dfrac{dy}{dt}=\dfrac{\cos t}{\sqrt{t}}\times\dfrac{+1}{2\sqrt{t}}$; $\dfrac{dy}{dx}=\dfrac{\cos^3 t}{2t^2}$.

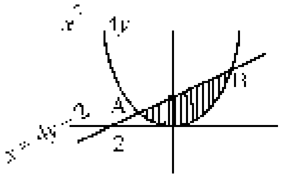
81.  Required Area = 4 × shaded area = $4\int_0^a b\sqrt{1-\dfrac{x^2}{a^2}}$; $dx=\pi\,ab$.

82. Solve $y=\dfrac{x}{\sqrt{3}}$ & $x^2+y^2=4 \Rightarrow A\equiv\left(\sqrt{3},1\right)$



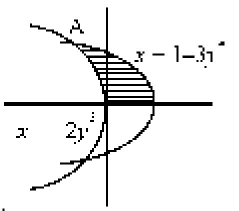
Required Area = $\int_0^1\left[\sqrt{4-y^2}-\sqrt{3}y\right]dy=\dfrac{\pi}{3}$

83. Solve $x^2 = 4y$ & $x = 4y - 2$ to get $A\equiv\left(-1,\dfrac{1}{4}\right)$ & $B \equiv (2, 1)$



Required Area = Shaded Area = $\int_{-1}^{2}\left(\dfrac{x+2}{4}-\dfrac{x^2}{4}\right)dx=\dfrac{9}{8}$

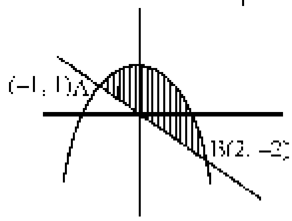
84. Required Area = 2 × shaded area = $2\int_0^{y_A}\left[(1-3y^2)-(-2y^2)\right]dy$



Solve $x=-2y^2$ & $x = 1-3y^2$. $\Rightarrow A \equiv (-2, 1)$

$\Rightarrow$ Required Area = $2\int_0^1(1-y^2)\,dy = 4/3$.

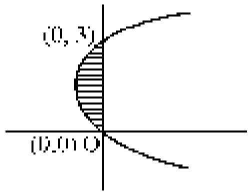
85. To get A & B, solve $y = 2 - x^2$ and $x + y = 0$



$\Rightarrow$ $A \equiv (-1, 1)$ & $B \equiv (2, -2)$

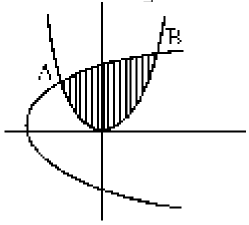
$\Rightarrow$ Shaded Area = $\int_{-1}^{2}\left[(2-x^2)-(-x)\right]dx=\dfrac{9}{2}$

86. $y^2 = x + 3y$



$\Rightarrow \quad \left(y - \frac{3}{2}\right)^2 = x + \frac{9}{4} \quad \Rightarrow$ Shaded Area $= -\int_0^3 \left[\left(y - \frac{3}{2}\right)^2 - \frac{9}{4}\right] dy = \frac{9}{2}$.

87. To get A & B solve $y^2 = 5x + 6$ & $x^2 = y$

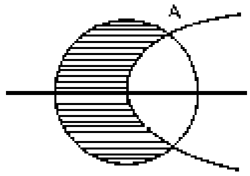


$\Rightarrow A \equiv (-1, 1)$ & $B \equiv (2, 4)$

Required Area = Shaded Area

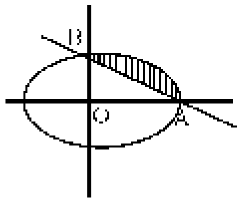
$= \int_{-1}^{2} \left(\sqrt{5x+6} - x^2\right) dx = \frac{81}{15} = \frac{27}{5}$

88. Required Area $= \pi\, 8^2 - 2 \int_0^{y_A} \left[\sqrt{64 - y^2} - \frac{y^2}{12}\right] dy$



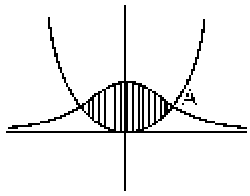
$= \frac{16}{3}\left(8\pi - \sqrt{3}\right)$

89. Shaded Area $= \int_0^a b\sqrt{1 - \frac{x^2}{a^2}}\, dx - \int_0^a b\left(1 - \frac{x}{a}\right) dx$



$= \frac{1}{4} ab\,(\pi - 2)$

90. Shaded Area $= 2 \int_0^{x_A} \left(\frac{2}{1+x^2} - x^2\right) dx$



Solve $y = \frac{2}{1+x^2}$ & $y = x^2$. $A \equiv (1, 1)$.

$\Rightarrow \quad$ Shaded Area $= 2\int_0^1 \left(\frac{2}{1+x^2} - x^2\right) dx = \pi - \frac{2}{3}$