دو لة الإمارات العربية المتحدة

وزارة التربية والتعليم

دائرة التعليم والمعرفة

وزارة الـتـربـيـة والـتـعـلـيـم

MINISTRY OF EDUCATION

المدرسة الإماراتية

Choose the right answer:

(1) $\int \dfrac{2}{4+x^2}\, dx$

a) $2\tan^{-1}(\dfrac{x}{4})+c$

b) $\tan^{-1}(\dfrac{x}{2})+c$

c) $\dfrac{1}{2}\tan^{-1}(\dfrac{x}{2})+c$

d) $2\tan^{-1}(\dfrac{x}{2})+c$

(2) $\int \dfrac{e^x}{9+e^x}\, dx$

a) $\tan^{-1}(\dfrac{e}{3})+c$

b) $\dfrac{1}{3}\ln(9+e^x)+c$

c) $\ln(9+e^x)+c$

d) $9e^x+x+c$

(3) $\int \tan^2 3x\, dx$

a) $\dfrac{1}{3}\tan(3x)-x+c$

b) $\sec^2(3x)-1+c$

c) $\sec(3x)\tan(3x)+c$

d) $\tan(3x)-3x+c$

(4) $\int 3\cos^2(x)\sin(x)\,dx$

a) $-\dfrac{\cos^3(x)}{3}+c$

b) $-3\cos^3(x)+c$

c) $-\cos(3x)^3+c$

d) $-\cos^3(x)+c$

(5) $\displaystyle\int_{-\frac{\pi}{4}}^{0}\sec x\,\tan x\,dx$

a) $1-\sqrt{2}$

b) $\sqrt{2}-1$

c) $1+\sqrt{2}$

d) $\sqrt{2}$

(6) $\displaystyle\int_{0}^{3}2x(x^2+1)^3\,dx$

(a) $\dfrac{1001}{4}$

(b) $\dfrac{10000}{4}$

(c) $\dfrac{81}{4}$

(d) (c) $\dfrac{9999}{4}$

(7) $\int x^2 \ln x \, dx$

a) $\frac{1}{3}x^3 \ln x - \frac{1}{9}x^3 + c$

b) $\frac{1}{3}x^3 \ln x - \frac{1}{6}x^3 + c$

c) $\frac{1}{3}x^3 \ln x - \frac{1}{9}x^2 + c$

d) $\frac{1}{3}x^3 \ln x - \frac{1}{6}x^2 + c$

(8)$\int \frac{3\cos(\ln x)}{x} \, dx \quad , x > 0$

a) $3\sin(\ln x) + c$

b) $3\cos(\ln x) + c$

c) $3\sec(\ln x) + c$

d) $3\tan(\ln x) + c$

(9)Determine the area of the region enclosed by:

$y = x^2 - 9 \, , \quad y = 3 - x$

(a)$\frac{343}{6}$

(b)$\frac{413}{6}$

(c)$\frac{301}{6}$

(d) $\frac{49}{6}$

(10) Determine the area of the region enclosed by:

$$y = 2 - x^2 \ , \qquad y = x^2 \qquad , 0 \le x \le 2$$
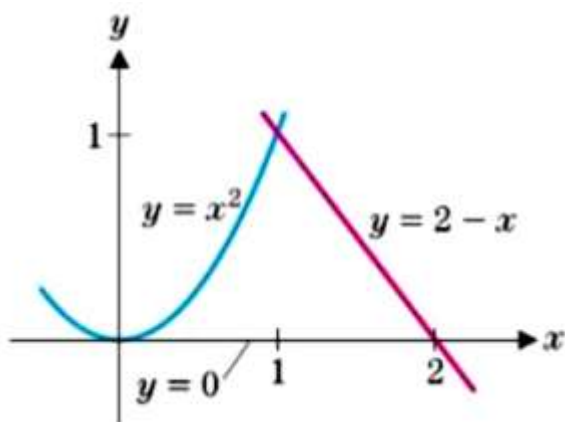
(a)$\dfrac{28}{3}$ (b)$\dfrac{8}{3}$ (c)$\dfrac{4}{3}$ (d) 4

(11) Determine the area of the region enclosed by:

$$y = x^2 \ , y = 2 - x \ , y = 0$$

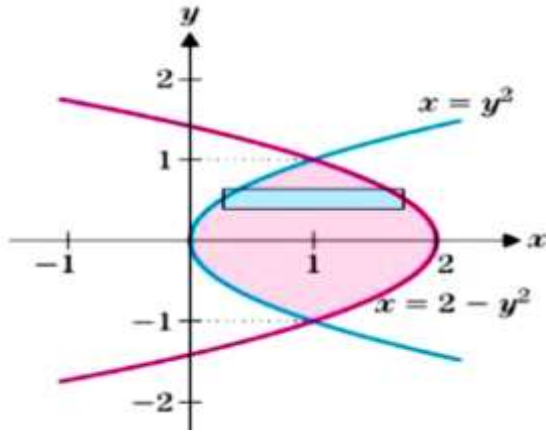

a) $\dfrac{2}{3}$ b) $\dfrac{7}{6}$

c) $\dfrac{5}{6}$ d) $\dfrac{11}{6}$

(12) Determine the area of the region enclosed by:

$$x = y^2 \quad , x = 2 - y^2$$

a) $\dfrac{2}{3}$

b) $\dfrac{8}{3}$

c) $\dfrac{10}{3}$

d) $\dfrac{4}{3}$

(13) Determine the area of the region enclosed by:

$$y = x^2 \quad , y = 2x$$

(a) $\dfrac{2}{3}$

(b) $\dfrac{4}{3}$

(c) $\dfrac{15}{2}$

(d) 8

(14) find the area of the region under the curve

$y = -x^2 + 4$, *and up the x − axis*

(a)$\frac{32}{3}$ (b)$\frac{16}{3}$ (c)$\frac{8}{3}$ (d) $\frac{64}{3}$

(15) Determine the area of the region enclosed by:

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

(a)$\frac{1}{6}$ (b)$\frac{1}{4}$ (c)$\frac{8}{3}$ (d) $\frac{2}{3}$

(16) Determine the area of the region enclosed by:

$$y = \sqrt{x} \ , \ y = x$$

(a)$\frac{1}{6}$　　　　(b)$\frac{7}{6}$　　　　　　　　(c)$\frac{2}{5}$　　　　　　(d)$\frac{2}{3}$

(17)find the volume of a region bounded by

$$y = \sqrt{x} \ , on \ [0,4] \ revolving \ about \ x - axis$$

(a)$\frac{16\pi}{3}$　　　　(b)16π　　　　(c)2π　　　　(d)8π

(18) find the volume of a region bounded by

$$y = 4 - x^2, \quad y = 0, revolving\ about\ y = -3$$

(a)$\dfrac{448\pi}{15}$　　　(b)$\dfrac{736\pi}{15}$　　　(c)$\dfrac{1472\pi}{15}$　　　(d) $\dfrac{2944\pi}{15}$

(19)) find the volume of a region bounded by

$$y = 4 - x^2, \quad y = 0, revolving\ about\ x = 3$$

(a)64π　　　(b)128π　　　(c)32π　　　(d) 16π

(20) find the volume of a region bounded by
$$y = x^2 , \quad y = 0 , -1 \le x \le 1$$
$revolving\ about\ x = 2$

(a)$\dfrac{16\pi}{3}$ (b)$\dfrac{8\pi}{3}$ (c)$\dfrac{2\pi}{3}$ (d) $\dfrac{4\pi}{3}$

(21) find the volume of a region bounded by
$$y = x , \quad y = -x , revolving\ about\ x = 1$$

(a)$\dfrac{16\pi}{3}$ (b)$\dfrac{8\pi}{3}$ (c)$\dfrac{2\pi}{3}$ (d) $\dfrac{4\pi}{3}$

(22)the height of the solid formed by revolving region bounded by

$$y = x , \quad y = -x, x = 1 \ , revolving \ about \ y - axis$$

(a)$2x$ (b)x (c)$2y$ (d)$1 - x$

(23)the radius of the solid formed by revolving region bounded by $y = x , y = -x$

$revolving \ about \ x = 2$

(a)$2x$ (b)x (c)$2 - y$ (d)$2 - x$

(24)the volume of the solid formed by revolving region bounded by $y = 4 - x^2$, and the $x - axis$ revolving about $x = 3$

a) $\int_{-2}^{2} 2\pi(3 - x)(4 - x^2)dx$

b) $\int_{-2}^{2} 2\pi(3 + x)(4 - x^2)dx$

c) $\int_{0}^{4} 2\pi(3 - x)(4 - x^2)dx$

d) $\int_{0}^{4} 2\pi(3 + x)(4 - x^2)dx$

(25) The length of the arc $f(x) = \sqrt{1 - x^2}$, $-1 \leq x \leq 1$

(a)$\frac{\pi}{2}$ (b)π (c)2π (d)$\frac{2\pi}{3}$

(26) The length of the arc $f(x) = \frac{1}{3}x^{\frac{3}{2}} - x^{\frac{1}{2}}$, $1 \leq x \leq 4$

(a)$\frac{20}{3}$　　　　(b)$\frac{10}{3}$　　　　(c)$\frac{5}{3}$　　　　(d)$\frac{256}{15}$

(27) The length of the arc $y = x^3$, $-2 \leq x \leq 2$

a) $\int_{-2}^{2} \sqrt{1 + 9x^4}\, dx$

b) $\int_{-2}^{2} \sqrt{1 + 9x^2}\, dx$

c) $\int_{-2}^{2} \sqrt{1 + 3x^4}\, dx$

d) $\int_{-2}^{2} \sqrt{1 + 3x^2}\, dx$

(28) the surface area of $y = x^4$, $0 \leq x \leq 1$
revolving about $x - axis$ is

a) $\displaystyle\int_0^1 2\pi x^4 \sqrt{1+4x^3}\ dx$

b) $\displaystyle\int_0^1 2\pi x^4 \sqrt{1+16x^5}\ dx$

c) $\displaystyle\int_0^1 2\pi x^4 \sqrt{1+16x^6}\ dx$

d) $\displaystyle\int_0^1 2\pi x^4 \sqrt{1+4x^6}\ dx$

(29) the surface area of $y = \sqrt{x}$, $1 \leq x \leq 2$
revolving about $x - axis$ is

a) $\displaystyle\int_1^2 2\pi\sqrt{x}\sqrt{1+\frac{1}{4x}}\ dx$

b) $\displaystyle\int_1^2 2\pi\sqrt{x}\sqrt{1+\frac{4}{x}}\ dx$

c) $\displaystyle\int_1^2 2\pi\sqrt{x}\sqrt{1+\frac{x}{4}}\ dx$

d) $\displaystyle\int_1^2 2\pi\sqrt{x}\sqrt{1+4x}\ dx$

(30)Identify the initial conditions $y(0)$ and $y'(0)$ for the vertical motion of an object ,if the object is thrown downward at a velocity 6m/s from a height of 30m.

(a) $y(0) = 30$, $y'(0)$ =6   (b) $y(0) = 0$, $y'(0)$ =6
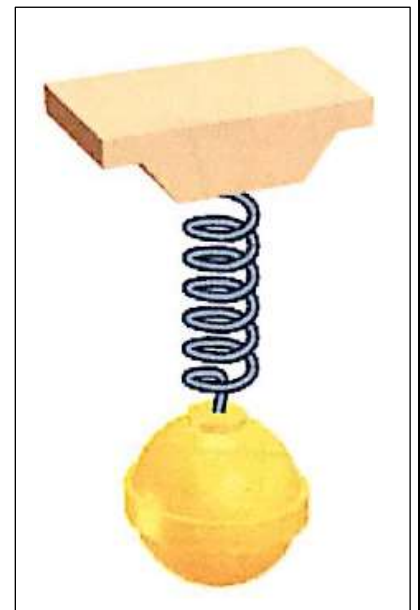
(c) $y(0) = 0$, $y'(0)$ =-6   (d) $y(0) = 30$, $y'(0)$ =-6

(31)) A force of 5 Newton stretches a spring $4cm$ from its natural length. find the work done in stretching the spring 6cm beyond its natural

(a) $\dfrac{45}{2}$ n.m   (b) $\dfrac{9}{40}$ n. m

(c) $\dfrac{9}{4000}$ n. m   (d) 2250 n.m

(32) A diver drops from 9m above the water. what is the diver's velocity at impact?

(a)$-4.33m/s$ (b)$-9.39m/s$

(c)$-13.33m/s$ (d)$-18.39m/s$

(33)find the value of c for which $f(x) = cx + x^2$ is a probability density function on interval$[0,1]$

(a)$\frac{4}{3}$ (b)$\frac{2}{3}$ (c)$\frac{8}{3}$ (d)$\frac{1}{3}$

(34) find the value of c for which $f(x) = \dfrac{c}{1+x^2}$ is a probability density function on interval $[0,1]$

(a)4π (b)$\dfrac{\pi-4}{\pi}$ (c)$\dfrac{\pi}{4}$ (d)$\dfrac{4}{\pi}$

(35)suppose that the lifetime in years of brand of lightbulb is exponentially distributed with pdf $f(x) = 4e^{-4x}$ .find the probability that given lightbulb lasts 3 months or less

   ((a)1-e   (b)1-e^{-1} (c)1+e   (d)e

(36) *find the mean of the random variable with the given pdf* $f(x) = 3x^2$ *on* $[0, 1]$

$(a) \dfrac{3}{4}$　　　　(b)1　　　　$(c)\dfrac{1}{2}$　　　　$(d) \dfrac{1}{3}$

(37) *find the median of the random variable with the given pdf* $f(x) = 3x^2$ *on* $[0, 1]$

$(a)\dfrac{3}{8}$　　　　$(b)\dfrac{1}{\sqrt[3]{2}}$　　　　$(c)\dfrac{3}{2}$　　　　$(d) \sqrt[3]{2}$

(38) $\int \dfrac{5}{\sqrt{16-x^2}} dx$

a) $5\sin^{-1}(\dfrac{x}{4})+c$

b) $\dfrac{5}{4}\sin^{-1}(\dfrac{x}{4})+c$

c) $5\sin^{-1}(\dfrac{x}{16})+c$

d) $\sqrt{5}\sin^{-1}(\dfrac{x}{4})+c$

(39) $\int \dfrac{2}{4+4x^2} dx$

a) $2\tan^{-1}(x)+c$

b) $\dfrac{1}{2}\tan^{-1}(x)+c$

c) $\dfrac{1}{2}\tan^{-1}(\dfrac{x}{2})+c$

d) $\tan^{-1}(x)+c$

(40) $\int \dfrac{4}{49+x^2} dx$

a) $\dfrac{2}{7}\tan^{-1}(\dfrac{x}{7})+c$

b) $\dfrac{4}{7}\tan^{-1}(x)+c$

c) $\dfrac{4}{7}\tan^{-1}(\dfrac{2x}{7})+c$

d) $\dfrac{4}{7}\tan^{-1}(\dfrac{x}{7})+c$

(50) $\int \frac{4}{5+2x+x^2} \, dx$

a) $\frac{2}{\sqrt{5}} \tan^{-1}(\frac{x}{\sqrt{5}}) + c$

b) $\tan^{-1}(\frac{x+1}{2}) + c$

c) $2\tan^{-1}(\frac{x+1}{2}) + c$

d) $\frac{4}{\sqrt{5}} \tan^{-1}(\frac{x}{\sqrt{5}}) + c$

(51) $\int \frac{x+1}{x^2+2x+4} \, dx$

(a) $2ln|x^2 + 2x + 4| + c$

(b) $\frac{1}{2} ln|x^2 + 2x + 4| + c$

(c) $\frac{1}{2}\tan^{-1}(\frac{x+1}{2}) + c$

(d) $\frac{1}{2}(x + 1)\tan^{-1}(\frac{x+2}{2}) + c$

(52) $\int \dfrac{e^x}{\sqrt{1-e^{2x}}} dx$

a) $2\sin^{-1}e^x + c$

b) $\sin^{-1}e^x + c$

c) $\dfrac{1}{2}\sin^{-1}e^x + c$

d) $\sin^{-1}e^{2x} + c$

(53) $\int x \ln x \, dx$

a) $x^2 \ln x - \dfrac{1}{2}x^2 + c$

b) $x \ln x - x + c$

c) $\dfrac{1}{2}x^2 \ln x - \dfrac{1}{4}x^2 + c$

d) $\dfrac{1}{2}x^2 \ln x - \dfrac{1}{2}x^2 + c$

(54) $\int \dfrac{3}{|x|\sqrt{x^2-25}} dx$

a) $\dfrac{3}{5}\sec^{-1}(\dfrac{x}{3}) + c$

b) $\dfrac{3}{5}\sec^{-1}(\dfrac{x}{25}) + c$

c) $\dfrac{3}{5}\sec^{-1}(\dfrac{x}{5}) + c$

d) $\dfrac{3}{25}\sec^{-1}(\dfrac{x}{25}) + c$

(55) $\int \dfrac{\sin \sqrt{x}}{\sqrt{x}} dx$

a) $-2\cos\sqrt{x}+c$

b) $-\dfrac{1}{2}\cos\sqrt{x}+c$

c) $-2\sin\sqrt{x}+c$

d) $2\cos\sqrt{x}+c$

(56) $\int\limits_{0}^{\frac{\pi}{4}} \sec^2 x\, e^{\tan x}\, dx$

a) e

b) $e-1$

c) $e+1$

d) $1-e$

(57) $\int\limits_{\frac{\pi}{4}}^{\frac{\pi}{2}} \csc^2 x\, dx$

(a)0   (b)-1   (c)1   (d)$\dfrac{\pi}{2}$

(58) $\int \dfrac{x^5}{1+x^6} dx$

a) $x^5 \tan^{-1}(x^3)$

b) $\ln(x+1)+c$

c) $\dfrac{7}{6}\dfrac{x^6}{x+x^7}+c$

d) $\dfrac{1}{6}\ln(1+x^6)+c$

(59) $\int \dfrac{\ln x^2}{x}\,dx$

a) $2\ln x + c$

b) $\dfrac{1}{2}(\ln x)^2 + c$

c) $\ln x^2 + c$

d) $(\ln x)^2 + c$

(60) $\int \dfrac{x}{\sqrt{1-x^4}}\,dx$

a) $\sin^{-1}(x^2) + c$

b) $\dfrac{1}{4}\sin^{-1}(x^2) + c$

c) $\dfrac{1}{2}\sin^{-1}(x^2) + c$

d) $\dfrac{1}{2}\sin^{-1}(x) + c$

(61) $\int e^{2\ln x}\,dx$

a) $\dfrac{x^3}{3} + c$

b) $x^2 + c$

c) $\dfrac{x}{2}e^{2\ln x} + c$

d) $e^{\ln x^2} + c$

(62) $\int \sec x \, dx$

(a)$\ln|\sec x + \tan x| + c$ (b) $\ln|\sec x \tan x| + c$

(c)$\dfrac{1}{\sin x} + c$ (d) $\csc x + c$

(63) $\int \tan 2x \, dx$

(a)$\dfrac{1}{2}\cot 2x + c$ (b) $\dfrac{-1}{2}\ln|\cos 2x| + c$

(c)$\dfrac{\sin 2x}{\cos 2x} + c$ (d) $-\cot x + c$

(64) $\int \sin^3 x \, dx$

a) $\dfrac{\cos^3 x}{3} - \cos x + c$ b) $\dfrac{\sin^4 x}{4} + c$

c) $-\dfrac{\cos^4 x}{4} + c$ d) $\dfrac{\cos^4 x}{4} - \cos x + c$

(65) $\int x e^{2x}\, dx$

a) $\frac{1}{2} x e^{2x} + \frac{1}{4} e^{2x} + c$

b) $\frac{1}{2} x e^{2x} - \frac{1}{4} e^{2x} + c$

c) $2x e^{2x} - 4 e^{2x} + c$

d) $\frac{1}{2} x e^{2x} - \frac{1}{2} e^{2x} + c$

(64) $\int x \ln x\, dx$

a) $\frac{1}{2} x^2 \ln x - \frac{1}{4} x^2 + c$

b) $\frac{1}{2} x^2 \ln x - \frac{1}{2} x^2 + c$

c) $\frac{1}{2} x^2 \ln x + c$

d) $x^2 \ln x - \frac{1}{4} x^2 + c$

(65) $\int x \sin x\, dx$

a) $-\frac{1}{2} x^2 \cos x + c$

b) $x \sin x + \cos x + c$

c) $-x \cos x + \sin x + c$

d) $-x \cos x - \sin x + c$

(66) $\int \cos \sqrt{x} \, dx$

a) $2\sqrt{x} \sin \sqrt{x} - 2 \cos \sqrt{x} + c$

b) $2\sqrt{x} \sin \sqrt{x} + 2 \cos \sqrt{x} + c$

c) $2\sqrt{x} \cos \sqrt{x} - 2 \sin \sqrt{x} + c$

d) $-2\sqrt{x} \sin \sqrt{x} + \cos \sqrt{x} + c$

(67) $\int e^{\sqrt{x}} dx$

a) $2\sqrt{x} e^{\sqrt{x}} - 2e^{\sqrt{x}} + c$

b) $2\sqrt{x} e^{\sqrt{x}} + 2e^{\sqrt{x}} + c$

c) $2\sqrt{x} e^{x} - 2e^{x} + c$

d) $\dfrac{2}{\sqrt{x}} e^{\sqrt{x}} + c$

(68) $\int \tan x \sec^3 x \, dx$

a) $\dfrac{1}{3} \tan^3 x + c$

b) $\dfrac{1}{4} \sec^4 x + c$

c) $\dfrac{1}{4} \tan^4 x + \dfrac{1}{2} \tan^2 x + c$

d) $\dfrac{1}{3} \sec^3 x + c$

(69) $\int \tan^4 x \sec^2 x \, dx$

a) $\frac{1}{5}\tan^5 x + \frac{1}{3}\sec^3 x + c$

b) $\frac{1}{7}\sec^7 x - \frac{1}{3}\sec^3 x + c$

c) $\frac{1}{5}\tan^5 x + c$

d) $\frac{1}{6}\tan^6 x + \frac{1}{5}\tan^5 x + c$

(70) $\int \cos^2 (x+1) \, dx$

a) $\frac{1}{2}x + \frac{1}{4}\sin(x+1) + c$

b) $\frac{1}{2}x + \frac{1}{4}\sin 2(x+1) + c$

c) $\frac{1}{2}x + \frac{1}{2}\sin(x+1) + c$

d) $\frac{1}{2}x + \frac{1}{2}\sin 2(x+1) + c$

(71) $\int \frac{x-5}{x^2-1} \, dx$

a) $3\ln|x+1| + 2\ln|x-1| + c$

b) $\ln|x^2-1| + c$

c) $3\ln|x+1| - 2\ln|x-1| + c$

d) $2\ln|x+1| - 3\ln|x-1| + c$

(72) $\int \dfrac{5x-2}{x^2-4}\,dx$

a) $3\ln|x+2|+2\ln|x-2|+c$ b) $3\ln|x+2|-2\ln|x-2|+c$

c) $3\ln|x-2|-2\ln|x+2|+c$ d) $2\ln|x+2|-3\ln|x-2|+c$

(73) $\int \dfrac{6x}{x^2-x-2}\,dx$

a) $4\ln|x+2|+2\ln|x-1|+c$ b) $4\ln|x-2|+2\ln|x+1|+c$

c) $2\ln|x-2|+4\ln|x+1|+c$ d) $4\ln|x-2|-2\ln|x+1|+c$

(74) $\int \dfrac{4x-5}{x^3-3x^2}\,dx$

a) $-\dfrac{7}{9}\ln|x|-\dfrac{5}{3}\dfrac{1}{x}+\dfrac{7}{9}\ln|x-3|+c$ b) $-\dfrac{7}{9}\ln|x|+\dfrac{7}{9}\ln|x-3|+c$

c) $-\dfrac{7}{9}\ln|x+3|+\dfrac{7}{9}\ln|x-3|+c$ d) $\ln|x^3-3x^2|+c$

(75) $\int \dfrac{2x+3}{x^2+2x+1}dx$

a) $2\ln|x+1|-\ln|x-1|+c$

b) $\ln|x+1|-2\ln|x-1|+c$

c) $2\ln|x+1|-\ln|x^2+1|+c$

d) $2\ln|x+1|-\dfrac{1}{x+1}+c$

(76)Determine whether the differential equation is not separable.

$(a) y' = (3x + 1)cosy$ $(b) y' = (3x + y)cosy$

$(c) y' = (3y + 1)cosx$ $(d) y' = 2xcosy - xy^3$

(77)Find the general solution for the equation

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

$(a) ln|y| = \dfrac{x^3}{3} + x + c$ $(b) y = \dfrac{x^3}{3} + x + c$

$(a) y = ce^{\frac{x^3}{3} + x}$ $(d)\ y = e^{\frac{x^3}{3} + x} + c$

(78) Find the general solution for the equation

$$y' = \frac{xy}{1+x^2}$$

(a)$y = c\sqrt{1 + x^2}$

(b)$ln|y| = \frac{1}{2} ln|x^2 + 1| + c$

(c)$y = ce^{\tan^{-1}x}$

(d) $y = ce^{\tan^{-1}x} + c$

(79)Solve the IVP explicity if possible.

$$y' = \frac{4y}{x+3} \quad , y(-2) = 1$$

(a)$y = e^4(x+3)^4$ (b)$y = (x+3)^{\frac{1}{4}}$

(c) $y = 4ln|x+3|$ (d) $y = (x+3)^4$

(80) suppose a bacterial culture initially has 400 cells. After 1 hour, the population has increased to 800.

quickly determine the population after 3 hours

(a)2400   (b)3200   (c)1600   (d)2800

(81) A bowl of porridge at 93^0C is placed in a 21^0C room . one minute later the porridge has cooled to 82^0C .when will the temperature be 49^0C.

(a)4   (b)6   (c)7   (d)10

(82)Suppose that the value of a 400000AED asset decrease at a constant percentage 40%.find its worth after 5 years .

(a)327492   (b)54134   (c)268128   (d)240000