Indefinite integral

1.Find

a) $\int 6x\,dx$

b) $\int 4x+1\,dx$

c) $\int 4x^{-\frac{1}{2}}\,dx$

d) $\int 7x^{-8}\,dx$

e) $\int (x+4)^2\,dx$

f) $\int \frac{4x^{-\frac{4}{3}}}{3}\,dx$

g) $\int (9-6x)dx$

h) $\int \frac{2x+5x^3}{x}\,dx$

i) $\int 2x(1-x)^2\,dx$

j) $\int \frac{(2x+1)^2}{\sqrt{x}}\,dx$

k) $\int \left(\frac{3}{\sqrt{x}}-\sqrt{x^3}\right)dx$

l) $\int \sqrt{x}(\sqrt{x}+5)^2\,dx$

2.Find the equation of the curve, given $\frac{dy}{dx}$ and a point on the curve

a) $\frac{dy}{dx}=3x^2-6x+2\,;(-2,-10)$

b) $\frac{dy}{dx}=(1-2x)^2\,;(1,8)$

c) $\frac{dy}{dx}=x(2x+5);(5,-1)$

d) $\frac{dy}{dx}=\sqrt{x}\left(\sqrt{x}-3\right);(9,12)$

e) $\frac{dy}{dx}=\frac{9x^3-3x}{x}\,;(-5,4)$

f) $\frac{dy}{dx}=(3x-1)(5x+2);(-4,-6)$

3. A curve is such that $\frac{dy}{dx}=\frac{5}{\sqrt{x}}-10\sqrt{x^3}$ and the point (1,-6) lies on the curve. Find the equation of the curve

4. A curve passes through the point (7,10) and its gradient function is $\frac{6}{x^3}+2$. Find the equation of the curve

5.The curve C, with the equation $y=f(x)$ passes through the point (-2,-1) and $f'(x)=x(3-x)$. Find the equation of C in the form of $y=f(x)$

6.A curve is such that $\frac{d^2y}{dx^2}=-8x$. The curve has a maximum point when x=1, and the point (2,-1) lies on the curve. Find the equation of the curve.

7.$f'(x)=8x^3-4+3x^{-\frac{1}{2}}$ and $f(4)=3$, find $f(x)$

8.Given that $\frac{d^2y}{dx^2} = -3x + 2$ and that when $x = -1.\frac{dy}{dx} = 5, y = 0$, find y in terms of x

9.The curve C passes through the point (3,10) and its gradient at any point is given by $\frac{dy}{dx} = 6x^2 - 4x + 3$

a) find the equation of the curve C

b) show that the point (2,-21)lies on the curve

10. A curve is such that $\frac{d^2y}{dx^2} = 6x$. The curve has a maximum point when x=-1 and the point (3,-2) lies on the curve. Find the equation of the curve.

11. The gradient of a curve is given by $\frac{dy}{dx} = ax + b$.Given that the curve passes through (0,0), (1,1) and (-2,16) , find the equation of the curve.

12. Find these integrals

a) $\int (2x-1)^6\, dx$

b) $\int (4-3x)^8\, dx$

c) $\int (5x+2)^5\, dx$

d) $\int \frac{1}{(3x+5)^5} dx$

e) $\int \frac{15}{(1-3x)^6} dx$

f) $\int \frac{2}{(5+2x)^9}\, dx$

g) $\int \frac{3}{\sqrt{7x+1}}\, dx$

h) $\int \frac{6}{\sqrt{(6x-5)^3}}\, dx$

i) $\int \frac{1}{\sqrt[3]{(7-x)}}\, dx$

j) $\int 3\sqrt{(1-x)}\, dx$

k) $\int \frac{4}{(1-2x)^7}\, dx$

l) $\int [\sqrt{(2+3x)}]^5\, dx$

13.A curve passes though the point (1,5) and its gradient function $(3x-4)^5$. Find the equation of the curve.

14. A curve is such that $\frac{dy}{dx} = (7-x)^4$ and the point (5,-3) lies on the curve. Find the equation of the curve.

15. $f'(x) = \frac{1}{(5x-3)^4}$ and $f(1) = -90$. Find $f(x)$.

16. $\frac{d^2y}{dx^2} = (\frac{1}{4}x + 1)^7$. When $x = 4, \frac{dy}{dx} = 6$ and when $x = 4, y = 0$. Find y in terms of x.