Methods of integration

Indefinite integrals (1)

QUESTION **1**   Find:

a $\displaystyle\int 2x\,dx$

b $\displaystyle\int 3x^2\,dx$

c $\displaystyle\int x^5\,dx$

d $\displaystyle\int 8x^4\,dx$

e $\displaystyle\int 21x^6\,dx$

f $\displaystyle\int 2x^3\,dx$

g $\displaystyle\int 8x^7\,dx$

h $\displaystyle\int 7x\,dx$

i $\displaystyle\int 10x^2\,dx$

j $\displaystyle\int 10x^9\,dx$

k $\displaystyle\int \frac{x^8}{8}\,dx$

l $\displaystyle\int \frac{2}{3}x^7\,dx$

m $\displaystyle\int (8x + 7)\,dx$

n $\displaystyle\int (x^2 + 6x - 2)\,dx$

o $\displaystyle\int (4x^3 - 2x^2 + x - 6)\,dx$

p $\displaystyle\int (10x^4 - 8x^3 + 9x^2)\,dx$

Methods of integration

Indefinite integrals (2)

QUESTION **1**   Find:

a $\displaystyle\int x^{-4}\,dx$

b $\displaystyle\int 5x^{-2}\,dx$

c $\displaystyle\int 4x^{-3}\,dx$

d $\displaystyle\int \frac{x^{-6}}{2}\,dx$

e $\displaystyle\int x^{\frac{1}{2}}\,dx$

f $\displaystyle\int 2x^{\frac{3}{2}}\,dx$

g $\displaystyle\int x^{-\frac{1}{2}}\,dx$

h $\displaystyle\int 6x^{-\frac{1}{4}}\,dx$

i $\displaystyle\int 3x^{-\frac{3}{2}}\,dx$

QUESTION **2**   Find:

a $\displaystyle\int (x+3)^2\,dx$

b $\displaystyle\int (7x-4)^3\,dx$

c $\displaystyle\int (8-3x)^6\,dx$

d $\displaystyle\int (9x+5)^{10}\,dx$

e $\displaystyle\int (6x-5)^{-2}\,dx$

f $\displaystyle\int (3x+2)^{-3}\,dx$

Methods of integration

Indefinite integrals (3)

QUESTION **1**   Find:

a $\displaystyle\int \frac{1}{x^4}\, dx$

b $\displaystyle\int \frac{dx}{(x+4)^6}$,

c $\displaystyle\int \sqrt{3x+2}\; dx$

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d $\displaystyle\int \frac{3}{4x^2}\, dx$

e $\displaystyle\int \sqrt{(4x-7)^3}\; dx$

f $\displaystyle\int \frac{1}{\sqrt{2x-1}}\, dx$

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QUESTION **2**   Find these indefinite integrals.

a $\displaystyle\int 6t^3\, dt$

b $\displaystyle\int y^4\, dy$

c $\displaystyle\int (1-p^2)\, dp$

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d $\displaystyle\int (2-h^{-2})\, dh$

e $\displaystyle\int \frac{dt}{t^2}$

f $\displaystyle\int \frac{5}{\sqrt{z}}\, dz$

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Page 37 1 a $x^2 + C$ b $x^3 + C$ c $\dfrac{x^6}{6} + C$ d $\dfrac{8x^5}{5} + C$ e $3x^7 + C$ f $\dfrac{x^4}{2} + C$ g $x^8 + C$

h $\dfrac{7x^2}{2} + C$ i $\dfrac{10x^3}{3} + C$ j $x^{10} + C$ k $\dfrac{x^9}{72} + C$ l $\dfrac{x^8}{12} + C$ m $4x^2 + 7x + C$ n $\dfrac{x^3}{3} + 3x^2 - 2x + C$ o $x^4 - \dfrac{2x^3}{3} + \dfrac{x^2}{2} - 6x + C$

p $2x^5 - 2x^4 + 3x^3 + C$

Page 38 1 a $-\dfrac{1}{3}x^{-3} + C$ b $-5x^{-1} + C$ c $-2x^{-2} + C$ d $-\dfrac{x^{-5}}{10} + C$ e $\dfrac{2x^{\frac{3}{2}}}{3} + C$ f $\dfrac{4x^{\frac{5}{2}}}{5} + C$ g $2x^{\frac{1}{2}} + C$ h $8x^{\frac{3}{4}} + C$

i $-6x^{\frac{-1}{2}} + C$ 2 a $\dfrac{(x+3)^3}{3} + C$ b $\dfrac{(7x-4)^4}{28} + C$ c $-\dfrac{(8-3x)^7}{21} + C$ d $\dfrac{(9x+5)^{11}}{99} + C$ e $-\dfrac{(6x-5)^{-1}}{6} + C$ f $-\dfrac{(3x+2)^{-2}}{6} + C$

Page 39 1 a $-\dfrac{1}{3x^3} + C$ b $-\dfrac{1}{5(x+4)^5} + C$ c $\dfrac{2\sqrt{(3x+2)^3}}{9} + C$ $\left(\text{or } \dfrac{2(3x+2)\sqrt{3x+2}}{9}\right)$ d $-\dfrac{3}{4x} + C$ e $\dfrac{\sqrt{(4x-7)^5}}{10} + C$

f $\sqrt{2x-1} + C$ 2 a $\dfrac{3t^4}{2} + C$ b $\dfrac{y^5}{5} + C$ c $p - \dfrac{p^3}{3} + C$ d $2h + h^{-1} + C$ e $-\dfrac{1}{t} + C$ f $10\sqrt{z} + C$