Exercises of Indefinite integrals

1) Find the following indefinite integrals:

a) $\int \sin(7x + 4)\,dx$ **b)** $\int (1 + \tan^2 x)\,dx$ **c)** $\int \frac{dx}{1 + 49x^2}$

d) $\int e^x\,dx$ **e)** $\int \frac{dx}{\sqrt{1 - x^2}}$ **f)** $\int \frac{dx}{\cos^2 x}$

2) Find the following indefinite integrals:

a) $\int \frac{dx}{x\sqrt{1 - \ln^2 x}}$ **b)** $\int \frac{\sin \arctan x}{1 + x^2}\,dx$ **c)** $\int \frac{8e^x}{1 + 36e^{2x}}\,dx$

d) $\int 4x^5 \cos(9x^6 - 3)\,dx$ **e)** $\int \frac{\cos(14 \ln x + 7)}{x}\,dx$ **f)** $\int \frac{dx}{x(1 + \ln^2 x)}$

3) Find the following integrals:

a) $\int \ln x\,dx$ **b)** $\int x \sin x\,dx$ **c)** $\int x\,e^x\,dx$

d) $\int x \cos x\,dx$ **e)** $\int x\,e^{3x}\,dx$ **f)** $\int x \ln x\,dx$

4) Find out the following indefinite integrals:

a) $\int (3x + 7)\cos 7x\,dx$ **b)** $\int x^2 \cos x\,dx$ **c)** $\int \ln(x^2 + 49)\,dx$

d) $\int \arctan x\,dx$ **e)** $\int \arcsin x\,dx$ **f)** $\int x^2\,e^x\,dx$

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5) Find out the following indefinite integrals:

a) $\int e^{8x} \sin x \, dx$ **b)** $\int x \arctan x \, dx$ **c)** $\int e^{5x} \sin x \, dx$

d) $\int \cos \ln x \, dx$ **e)** $\int e^{x} \sin x \, dx$ **f)** $\int e^{x} \cos x \, dx$

6) Find out the following indefinite integrals:

a) $\int \frac{4x - 3}{x^2 + 4x - 45} \, dx$ **b)** $\int \frac{4x - 7}{x^2 - 2x + 1} \, dx$ **c)** $\int \frac{x - 8}{x^2 - 16x + 64} \, dx$

d) $\int \frac{2x - 2}{x^2 - 49} \, dx$ **e)** $\int \frac{x - 10}{x^2 - 18x + 81} \, dx$ **f)** $\int \frac{6x + 4}{x^2 + 5x - 14} \, dx$

7) Find the following integrals:

a) $\int \frac{x}{x^2 + 25} \, dx$ **b)** $\int \frac{2}{x^2 + 81} \, dx$ **c)** $\int \frac{2x - 10}{9x^2 + 16} \, dx$

d) $\int \frac{3x}{49x^2 + 4} \, dx$ **e)** $\int \frac{9}{x^2 + 9} \, dx$ **f)** $\int \frac{2}{25x^2 + 25} \, dx$

8) Find the following indefinite integrals:

a) $\int \frac{2x - 4}{x^2 - 16x + 68} \, dx$ **b)** $\int \frac{-8}{x^2 - 6x + 34} \, dx$ **c)** $\int \frac{2x}{x^2 + 6x + 25} \, dx$

d) $\int \frac{2x + 9}{x^2 + 2x + 26} \, dx$ **e)** $\int \frac{6x + 5}{x^2 - 2x + 26} \, dx$ **f)** $\int \frac{2x + 8}{x^2 - 12x + 85} \, dx$

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Answers:

1)
a) $\frac{-\cos(7x+4)}{7} + C$
b) $\tan x + C$
c) $\frac{\arctan(7x)}{7} + C$
d) $e^x + C$
e) $\arcsin x + C$
f) $\tan x + C$

2)
a) $\arcsin \ln x + C$
b) $-\cos \arctan x + C$
c) $\frac{4}{3}\arctan(6\,e^x) + C$
d) $\frac{2}{27}\sin(9x^6 - 3) + C$
e) $\frac{\sin(14\ln x + 7)}{14} + C$
f) $\arctan \ln x + C$

3)
a) $x(\ln x - 1) + C$
b) $-x\cos x + \sin x + C$
c) $e^x(x-1) + C$
d) $x\sin x + \cos x + C$
e) $\frac{e^{3x}(3x-1)}{9} + C$
f) $\frac{x^2(2\ln x - 1)}{4} + C$

4)
a) $\frac{3\cos 7x + (21x+49)\sin 7x}{49} + C$
b) $(x^2-2)\sin x + 2x\cos x + C$
c) $x\ln|x^2+49| - 2x + 14\arctan\frac{x}{7} + C$
d) $\frac{2x\arctan x - \ln|1+x^2|}{2} + C$
e) $x\arcsin x + \sqrt{1-x^2} + C$
f) $e^x(x^2 - 2x + 2) + C$

5)
a) $\frac{e^{8x}(8\sin x - \cos x)}{65} + C$
b) $\frac{(x^2+1)\arctan x - x}{2} + C$
c) $\frac{e^{5x}(5\sin x - \cos x)}{26} + C$
d) $\frac{x(\sin\ln x + \cos\ln x)}{2} + C$
e) $\frac{e^x(\sin x - \cos x)}{2} + C$
f) $\frac{e^x(\sin x + \cos x)}{2} + C$

6)
a) $\frac{39}{14}\ln|x+9| + \frac{17}{14}\ln|x-5| + C$
b) $4\ln|x-1| + \frac{3}{x-1} + C$
c) $\ln|x-8| + C$
d) $\frac{8}{7}\ln|x+7| + \frac{6}{7}\ln|x-7| + C$
e) $\ln|x-9| + \frac{1}{x-9} + C$
f) $\frac{16}{9}\ln|x-2| + \frac{38}{9}\ln|x+7| + C$

7)
a) $\frac{1}{2}\ln|x^2+25| + C$
b) $\frac{2}{9}\arctan\frac{x}{9} + C$
c) $\frac{1}{9}\ln|9x^2+16| - \frac{5}{6}\arctan\frac{3x}{4} + C$
d) $\frac{3}{98}\ln|49x^2+4| + C$
e) $3\arctan\frac{x}{3} + C$
f) $\frac{2}{25}\arctan x + C$

Exercises of Indefinite integrals

8)

a) $\ln|x^2 - 16x + 68| + 6 \arctan \frac{x-8}{2} + C$

b) $-\frac{8}{5} \arctan \frac{x-3}{5} + C$

c) $\ln|x^2 + 6x + 25| - \frac{3}{2} \arctan \frac{x+3}{4} + C$

d) $\ln|x^2 + 2x + 26| + \frac{7}{5} \arctan \frac{x+1}{5} + C$

e) $3 \ln|x^2 - 2x + 26| + \frac{11}{5} \arctan \frac{x-1}{5} + C$

f) $\ln|x^2 - 12x + 85| + \frac{20}{7} \arctan \frac{x-6}{7} + C$