

Chapter 8 Answers

Exercise 8A

- 1** $y = \frac{1}{6}x^6 + c$ **2** $y = 2x^5 + c$
3 $y = x^3 + c$ **4** $y = x^{-1} + c$
5 $y = 2x^{-2} + c$ **6** $y = \frac{3}{5}x^{\frac{5}{3}} + c$
7 $y = \frac{8}{3}x^{\frac{3}{2}} + c$ **8** $y = -\frac{2}{7}x^7 + c$
9 $y = \frac{1}{2}x^6 + c$ **10** $y = -x^{-3} + c$
11 $y = 2x^{\frac{1}{2}} + c$ **12** $y = -10x^{-\frac{1}{2}} + c$
13 $y = 4x^{-\frac{1}{2}} + c$ **14** $y = \frac{9}{2}x^{\frac{4}{3}} + c$
15 $y = 3x^{12} + c$ **16** $y = 2x^{-7} + c$
17 $y = -9x^{\frac{1}{3}} + c$ **18** $y = -5x + c$
19 $y = 3x^2 + c$ **20** $y = \frac{10}{3}x^{0.6} + c$

Exercise 8B

- 1 a** $y = 2x^2 + x^{-1} + 4x^{\frac{3}{2}} + c$
b $y = 5x^3 - 3x^{-2} + 2x^{-\frac{3}{2}} + c$
c $y = \frac{1}{4}x^4 - 3x^{\frac{1}{2}} + 6x^{-1} + c$
d $y = x^4 + 3x^{\frac{1}{3}} + x^{-1} + c$
e $y = 4x + 4x^{-3} + 4x^{\frac{1}{2}} + c$
f $y = 3x^{\frac{5}{3}} - 2x^5 - \frac{1}{2}x^{-2} + c$
g $y = 4x^{-\frac{1}{3}} - 3x + 4x^2 + c$
h $y = x^5 + 2x^{-\frac{1}{2}} + 3x^{-4} + c$
2 a $f(x) = 6x^2 - 3x^{-\frac{1}{2}} + 5x + c$
b $f(x) = x^6 - x^{-6} + x^{-\frac{1}{6}} + c$
c $f(x) = x^{\frac{1}{2}} + x^{-\frac{1}{2}} + c$
d $f(x) = 5x^2 - 4x^{-2} + c$
e $f(x) = 3x^{\frac{2}{3}} - 6x^{-\frac{2}{3}} + c$
f $f(x) = 3x^3 - 2x^{-2} + \frac{1}{2}x^{\frac{1}{2}} + c$
g $f(x) = \frac{1}{3}x^3 - x^{-1} + \frac{2}{3}x^{\frac{3}{2}} + c$
h $f(x) = x^{-2} - x^2 + \frac{4}{3}x^{\frac{3}{2}} + c$

Exercise 8C

- 1** $\frac{1}{4}x^4 + x^2 + c$ **2** $-2x^{-1} + 3x + c$
3 $2x^{\frac{5}{2}} - x^3 + c$ **4** $\frac{4}{3}x^{\frac{3}{2}} - 4x^{\frac{1}{2}} + 4x + c$
5 $x^4 + x^{-3} + rx + c$ **6** $t^3 + t^{-1} + c$
7 $\frac{2}{3}t^3 + 6t^{-\frac{1}{2}} + t + c$ **8** $\frac{1}{2}x^2 + 2x^{\frac{1}{2}} - 2x^{-\frac{1}{2}} + c$
9 $\frac{p}{5}x^5 + 2tx - 3x^{-1} + c$ **10** $\frac{p}{4}t^4 + q^2t + px^3t + c$

Exercise 8D

- 1 a** $\frac{1}{2}x^4 + x^3 + c$ **b** $2x - \frac{3}{x} + c$
c $\frac{4}{3}x^3 + 6x^2 + 9x + c$ **d** $\frac{2}{3}x^3 + \frac{1}{2}x^2 - 3x + c$
e $\frac{4}{5}x^{\frac{5}{2}} + 2x^{\frac{3}{2}} + c$
2 a $\frac{1}{3}x^3 + 2x^2 + 4x + c$ **b** $\frac{1}{3}x^3 + 2x - \frac{1}{x} + c$
c $\frac{1}{2}x^2 + \frac{8}{3}x^{\frac{3}{2}} + 4x + c$ **d** $\frac{2}{5}x^{\frac{5}{2}} + \frac{4}{3}x^{\frac{3}{2}} + c$
e $\frac{2}{3}x^{\frac{3}{2}} + 4x^{\frac{1}{2}} + c$ **f** $2x^{\frac{1}{2}} + \frac{4}{3}x^{\frac{3}{2}} + c$
3 a $2x^{\frac{3}{2}} - \frac{1}{x} + c$ **b** $4x^{\frac{1}{2}} + x^3 + c$
c $\frac{3}{5}x^{\frac{5}{3}} - \frac{2}{x^2} + c$ **d** $-\frac{1}{x^2} - \frac{1}{x} + 3x + c$
e $\frac{1}{4}x^4 - \frac{1}{3}x^3 + \frac{3}{2}x^2 - 3x + c$
f $4x^{\frac{1}{2}} + \frac{6}{5}x^{\frac{5}{2}} + c$ **g** $\frac{1}{3}x^3 - 3x^2 + 9x + c$
h $\frac{8}{5}x^{\frac{5}{2}} + \frac{8}{3}x^{\frac{3}{2}} + 2x^{\frac{1}{2}} + c$
i $3x + 2x^{\frac{1}{2}} + 2x^3 + c$ **j** $\frac{2}{5}x^{\frac{5}{2}} + 3x^2 + 6x^{\frac{3}{2}} + c$

Exercise 8E

- 1 a** $y = x^3 + x^2 - 2$ **b** $y = x^4 - \frac{1}{x^2} + 3x + 1$
c $y = \frac{2}{3}x^{\frac{3}{2}} + \frac{1}{12}x^3 + \frac{1}{3}$ **d** $y = 6\sqrt{x} - \frac{1}{2}x^2 - 4$
e $y = \frac{1}{3}x^3 + 2x^2 + 4x + \frac{2}{3}$ **f** $y = \frac{2}{5}x^{\frac{5}{2}} + 6x^{\frac{1}{2}} + 1$
2 $f(x) = \frac{1}{2}x^4 + \frac{1}{x} + \frac{1}{2}$
3 $y = 1 - \frac{2}{\sqrt{x}} - \frac{3}{x}$
4 a $f_2(x) = \frac{x^3}{3}; f_3(x) = \frac{x^4}{12}$
b $\frac{x^{n+1}}{3 \times 4 \times 5 \times \dots \times (n+1)}$
5 $f_2(x) = x + 1; f_3(x) = \frac{1}{2}x^2 + x + 1;$
 $f_4(x) = \frac{1}{6}x^3 + \frac{1}{2}x^2 + x + 1$

Mixed Exercise 8F

- 1 a** $\frac{2}{3}x^3 - \frac{3}{2}x^2 - 5x + c$ **b** $\frac{3}{4}x^{\frac{4}{3}} + \frac{3}{2}x^{\frac{2}{3}} + c$
2 $\frac{1}{3}x^3 - \frac{3}{2}x^2 + \frac{2}{x} + \frac{1}{6}$
3 a $2x^4 - 2x^3 + 5x + c$ **b** $2x^{\frac{5}{2}} + \frac{4}{3}x^{\frac{3}{2}} + c$
4 $\frac{4}{5}x^{\frac{5}{2}} - \frac{2}{3}x^{\frac{3}{2}} - 6x^{\frac{1}{2}} + c$
5 $x = t^3 - t^2 + t + 1; x = 7$
6 $2x^{\frac{3}{2}} + 4x^{\frac{1}{2}} + c$
7 $x = 12\frac{1}{3}$
8 a $A = 6, B = 9$ **b** $\frac{3}{5}x^{\frac{5}{3}} + \frac{9}{2}x^{\frac{4}{3}} + 9x + c$
9 a $\frac{3}{2}x^{-\frac{1}{2}} + 2x^{-\frac{3}{2}}$ **b** $2x^{\frac{3}{2}} - 8x^{\frac{1}{2}} + c$
10 a $5x - 8x^{\frac{1}{2}} - \frac{2}{3}x^{\frac{3}{2}} + c$