

## 8. Integration

Name:	Class:	Date:
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Mark	/ 15	%
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1) Find an expression for  $f(x)$  given that [2]

a)  $f'(x) = x^3$

b)  $f'(x) = 2x^5 + 6x^{-4} - \frac{1}{2}x^{-\frac{2}{3}}$

2) Find an expression for  $y$  given that [3]

a)  $\frac{dy}{dx} = 145x^{\frac{1}{5}}$

b)  $\frac{dy}{dx} = 10x^3 + x^{-5} - 7x^{\frac{1}{3}}$

c)  $\frac{dy}{dx} = 2x^{\frac{1}{3}} - 6x^4 - 8x^{-3}$

3) Find [7]

a)  $\int (14x^{\frac{2}{3}} + 11x^3) dx$

b)  $\int (20x^3 + 6x^{-5} + a) dx$

c)  $\int (2x^4 - 2d + 20x^{-2}) dx$

d)  $\int (9x - 4)^2 dx$

e)  $\int (3\sqrt{x} + 5)^2 dx$

f)  $\int \left( 2\sqrt{x} + \frac{3}{\sqrt{x}} \right) dx$

g)  $\int \left( \frac{7}{\sqrt{x}} + 3x\sqrt{x} \right) dx$

4) Find the equation of the curve given that

[2]

a)  $\frac{dy}{dx} = 12\sqrt{x} + 6x$  at the point (1,12)

b)  $\frac{dy}{dx} = (9x + 3)^2$  at the point (-1,-12)

5) The curve S, with equation  $y = f(x)$ , passes through the point (1,-3) and  $f'(x) = 8x^3 - \frac{9}{x^4}$ . Find the equation of S in the form  $y = f(x)$ .

[1]

## Solutions for the assessment 8. Integration

1) a)  $f(x) = \frac{1}{4}x^4 + c$

b)  $f(x) = \frac{1}{3}x^6 - 2x^{-3} - \frac{3}{2}x^{\frac{1}{3}} + c$

2) a)  $y = \frac{725}{6}x^{\frac{6}{5}} + c$

b)  $y = \frac{5}{2}x^4 - \frac{1}{4}x^{-4} - \frac{21}{4}x^{\frac{4}{3}} + c$

c)  $y = \frac{3}{2}x^{\frac{4}{3}} - \frac{6}{5}x^5 + 4x^{-2} + c$

3) a)  $\frac{42}{5}x^{\frac{5}{3}} + \frac{11}{4}x^4 + c$

b)  $5x^4 - \frac{3}{2}x^{-4} + ax + c$

c)  $\frac{2}{5}x^5 - 2dx - 20x^{-1} + c$

d)  $27x^3 - 36x^2 + 16x + c$

e)  $\frac{9}{2}x^2 + 20x^{\frac{3}{2}} + 25x + c$

f)  $\frac{4}{3}x^{\frac{3}{2}} + 6x^{\frac{1}{2}} + c$

g)  $14x^{\frac{1}{2}} + \frac{6}{5}x^{\frac{5}{2}} + c$

4) a)  $y = 8x^{\frac{3}{2}} + 3x^2 + 1$

b)  $y = 27x^3 + 27x^2 + 9x - 3$

5)  $f(x) = 2x^4 + \frac{3}{x^3} - 8$