3. $$f(x) = \frac{1}{x(3x-1)^2} = \frac{A}{x} + \frac{B}{(3x-1)} + \frac{C}{(3x-1)^2}$$

(a) Find the values of the constants A, B and C

(4)

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October 2021

3. $$g(x) = \frac{3x^3 + 8x^2 - 3x - 6}{x(x+3)} \equiv Ax + B + \frac{C}{x} + \frac{D}{x+3}$$

(a) Find the values of the constants A, B, C and D.

(5)

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June 2022

2. (a) Express $\dfrac{1}{(1+3x)(1-x)}$ in partial fractions.

(3)

2. (a) Express $\dfrac{3x}{(2x-1)(x-2)}$ in partial fraction form.

(3)

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January 2023

1. $$f(x) = \frac{5x + 10}{(1 - x)(2 + 3x)}$$

(a) Write f (x) in partial fraction form.

(3)

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3. $$f(x) = \frac{8x - 5}{(2x - 1)(4x - 3)} \qquad x > 1$$

(a) Express $f(x)$ in partial fractions.

(3)

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2. Given that

$$\frac{3x+4}{(x-2)(2x+1)^2} \equiv \frac{A}{x-2} + \frac{B}{2x+1} + \frac{C}{(2x+1)^2}$$

(a) find the values of the constants A, B and C.

(4)

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7.

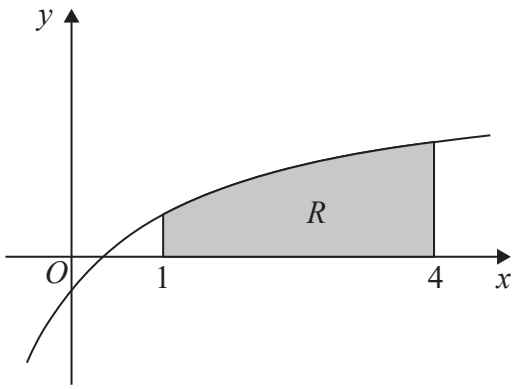


Figure 4

Figure 4 shows a sketch of part of the curve with equation

$$y = \frac{3x - 1}{x + 2} \qquad x > -2$$

(a) Show that

$$\frac{3x - 1}{x + 2} \equiv A + \frac{B}{x + 2}$$

where A and B are constants to be found.

(2)

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9. (a) Express $\dfrac{1}{x(2x-1)}$ in partial fractions.

(2)

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4. **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

$$f(x) = \frac{5 + 17x - 10x^2}{x(1 - x)(2x + 1)} \qquad x > 1$$

(a) Write $f(x)$ in the form

$$\frac{A}{x} + \frac{B}{1 - x} + \frac{C}{2x + 1}$$

where A, B and C are constants to be found.

(3)

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7: **In this question you must show all stages of your working.**
Solutions relying on calculator technology are not acceptable.

(a) Show that the substitution $u = e^x - \frac{1}{2}$ transforms

$$\int_{\ln 3}^{\ln 8} \frac{24e^x - 2}{(2e^x - 1)^2}\,dx$$

to

$$\int_a^b \frac{12u + 5}{u^2(2u + 1)}\,du$$

where a and b are constants to be found.

(4)

(b) Find an expression for $\frac{12u + 5}{u^2(2u + 1)}$ in the form

$$\frac{A}{u^2} + \frac{B}{u} + \frac{C}{(2u + 1)}$$

where A, B and C are integers.

(3)

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June 2026

1. $$f(x) = \frac{2+11x}{(1+x)(2+5x)}$$

(a) Write $f(x)$ in partial fraction form.

(3)

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2. Given that

$$\frac{2x^2 - x + 11}{(x + 2)(2x - 3)} \equiv A + \frac{B}{x + 2} + \frac{C}{2x - 3}$$

(a) find the value of each of the constants A, B and C.

(4)

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