

PARTIAL FRACTIONS

A2 Unit 3: Pure Mathematics B

WJEC past paper questions: 2008 – 2017

Total marks available 69 (approximately 1 hour 25 minutes)

1. Given that

$$f(x) = \frac{1}{x^2(2x-1)}$$

(a) express $f(x)$ in partial fractions,

[4]

(b) find $\int f(x)dx$.

[3]

(Summer 08)

2.

Given that

$$f(x) = \frac{3x}{(1+x)^2(2+x)}$$

(a) express $f(x)$ in terms of partial fractions,

[4]

(b) evaluate

$$\int_0^1 f(x)dx$$

giving your answer correct to three decimal places.

[4]

(Summer 09)

3. The function f is defined by

$$f(x) = \frac{8-x-x^2}{x(x-2)^2}$$

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

[4]

(b) Use your result to part (a) to find the value of $f'(1)$.

[3]

(Summer 10)

4. Given that $f(x) = \frac{x^2 + x + 13}{(x+2)^2(x-3)}$,

(a) express $f(x)$ in terms of partial fractions, [4]

(b) evaluate

$$\int_6^7 f(x) dx,$$

giving your answer correct to three decimal places. [3]

(Summer 11)

5. The function f is defined by

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

(a) Express $f(x)$ in terms of partial fractions. [4]

(b) Use your result to part (a) to find the value of $f'(0)$. [3]

(Summer 12)

6. The function f is defined by

$$f(x) = \frac{6 + x - 9x^2}{x^2(x+2)}.$$

(a) Express $f(x)$ in terms of partial fractions. [4]

(b) Using your result to part (a),

(i) find an expression for $f'(x)$,

(ii) verify that $f(x)$ has a stationary value when $x = 2$. [3]

(Summer 13)

7. (a) Express $\frac{5x^2 + 7x + 17}{(x+1)^2(x-4)}$ in terms of partial fractions. [4]

(b) Use your answer to part (a) to express $\frac{5x^2 + 9x + 9}{(x+1)^2(x-4)}$ in terms of partial fractions. [2]

(Summer 14)

8.

Given that $f(x) = \frac{2x^2 + 5x + 25}{(x+3)^2(x-1)}$,

(a) express $f(x)$ in terms of partial fractions, [4]

(b) evaluate

$$\int_3^{10} f(x) dx,$$

giving your answer correct to two decimal places. [3]

(Summer 15)

9.

The function f is defined by

$$f(x) = \frac{17 + 4x - x^2}{(2x-1)(x-3)^2}.$$

(a) Express $f(x)$ in terms of partial fractions. [4]

(b) Use your result to part (a) to find an expression for $f'(x)$. [2]

(Summer 16)

10.

(a) Express $\frac{8x^2 + 7x - 25}{(x-1)^2(x+4)}$ in terms of partial fractions. [4]

(b) Use your result to part (a) to express $\frac{9x^2 + 5x - 24}{(x-1)^2(x+4)}$ in terms of partial fractions. [3]

(Summer 17)