A228 Algebraic fractions

Q1.

(a) Solve $\frac{9+x}{7} = 11 - x$

x = ...

(3)

(b) Simplify $\frac{4(y+3)^3}{(y+3)^2}$

.....

(1)

(Total for question = 4 marks)

Q2.

Show that $\frac{a}{b+1} - \frac{a}{(b+1)^2}$ can be written as $\frac{ab}{(b+1)^2}$

(Total for question = 2 marks)

Q3.

(a) Factorise $3(x - y)^2 - 2(x - y)$

.....

(2)

(b) Show that $\frac{1}{2x^2 + x - 15} \div \frac{1}{3x^2 + 9x}$ simplifies to $\frac{ax}{bx + c}$ where a, b and c are integers.

(3)

(Total for question = 5 marks)

Q4.

$x^2 - 9y^2 = 0$ where $x > 0$ and $y > 0$

(a) Work out the ratio $x : y$

.....

(3)

(b) Simplify fully $\dfrac{3 - 4x - 4x^2}{2x^2 - 7x + 3}$

.....

(3)

(Total for question = 6 marks)

Q5.

(a) Simplify $\dfrac{x^2 - 16}{2x^2 - 5x - 12}$

.....

(3)

(b) Make v the subject of the formula $w = \dfrac{15(t - 2v)}{v}$

.....

(3)

(Total for question = 6 marks)

Q6.

Write

$$4 - \left[(x+3) \div \frac{x^2 + 5x + 6}{x - 2} \right]$$

as a single fraction in its simplest form.
You must show your working.

.....

(Total for question is 4 marks)

Q7.

Show that $\frac{3x+6}{x^2-3x-10} \div \frac{x+5}{x^3-25x}$ simplifies to ax where a is an integer.

(Total for question = 4 marks)

Q8.

Show that $\frac{1}{6x^2 + 7x - 5} \div \frac{1}{4x^2 - 1}$ simplifies to $\frac{ax + b}{cx + d}$ where *a*, *b*, *c* and *d* are integers

(Total for question = 3 marks)

Q9.

Show that $\frac{2x^2 - 3x - 5}{x^2 + 6x + 5}$ can be written in the form $\frac{ax + b}{cx + d}$ where *a*, *b*, *c* and *d* are integers.

(Total for question is 3 marks)

Q10.

(a) Write $\frac{4x^2-9}{6x+9} \times \frac{2x}{x^2-3x}$ in the form $\frac{ax+b}{cx+d}$ where *a*, *b*, *c* and *d* are integers.

.....

(3)

(b) Express $\frac{3}{x+1} + \frac{1}{x-2} - \frac{4}{x}$ as a single fraction in its simplest form.

.....

(3)

(Total for question = 6 marks)

Q11.

Show that $6 + \left[(x + 5) \div \frac{x^2 + 3x - 10}{x - 1} \right]$ simplifies to $\frac{ax - b}{cx - d}$ where *a*, *b*, *c* and *d* are integers.

(Total for question = 4 marks)

Q12.

Show that $\frac{7x-14}{x^2+4x-12} \div \frac{x-6}{x^3-36x}$ simplifies to ax where a is an integer.

(Total for question = 4 marks)

Q13.

Given that

$$2x - 1 : x - 4 = 16x + 1 : 2x - 1$$

find the possible values of x.

.....

(Total for question = 5 marks)

Q14.

Solve $\frac{3x-2}{4} - \frac{2x+5}{3} = \frac{1-x}{6}$

x = ...

(Total for question = 4 marks)

Q15.

Solve $\frac{x+2}{3x} + \frac{x-2}{2x} = 3$

x = ...

(Total for question is 3 marks)

Q16.

$2 - \frac{x+2}{x-3} - \frac{x-6}{x+3}$ can be written as a single fraction in the form $\frac{ax+b}{x^2-9}$

where *a* and *b* are integers.

Work out the value of *a* and the value of *b*.

a = ...

b = ...

(Total for question = 4 marks)