

## Topic 23 Algebraic fractions (Pre-TT) [36]

1.

(a) Show that  $(x + 2)(x + 3)$  expands and simplifies to  $x^2 + 5x + 6$

(2)

(b) Simplify

$$\frac{x^2 + 5x + 6}{(x + 3)^2}$$

(2)

(Total 4 marks)

2.

..

Show that  $\frac{5}{n+3} + \frac{2}{n-1} = \frac{7n+1}{(n+3)(n-1)}$ .

[3]

3. Non-calculator

Prove algebraically that the difference between the squares of any two consecutive integers is equal to the sum of these two integers.

(Total 3 marks)

4.

Solve the equation  $\frac{x+1}{3} + \frac{x+2}{5} = 1$

You must show your working.

(Total 4 marks)

5.

Simplify  $\frac{x^2 + 5x + 6}{3x^2 + x - 10}$

(Total 4 marks)

6. N.B. The symbol in the question is division.

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 3 marks)

7.

Solve the equation

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

(Total 6 marks)

8.

Show that the mean of 5 consecutive numbers is always equal to the median of the 5 numbers.

[4]

9. Non-calculator

Solve the equation  $\frac{1}{x+1} + \frac{5x}{x-2} = 3$

(Total 5 marks)