

## Topic X1: Indices, surds and quadratics (Post-TT B) [24]

1.

Solve the equation  $x^6 + 26x^3 - 27 = 0$ .

[5]

(Total 5 marks)

2.

Express each of the following in the form  $3^n$ :

(i)  $\frac{1}{9}$ ,

[1]

(ii)  $\sqrt[3]{3}$ ,

[1]

(iii)  $3^{10} \times 9^{15}$ .

[2]

(Total 4 marks)

3.

By using the substitution  $u = (3x - 2)^2$ , find the roots of the equation

$$(3x - 2)^4 - 5(3x - 2)^2 + 4 = 0.$$

[6]

(Total 6 marks)

4.

Simplify

(i)  $\frac{(4x)^2 \times 2x^3}{x}$ ,

[2]

(ii)  $(36x^{-2})^{-\frac{1}{2}}$ .

[3]

(Total 5 marks)

5.

Express  $3x^2 - 18x + 4$  in the form  $p(x + q)^2 + r$ .

[4]

(Total 4 marks)