Indices and surds – 2023 Additional Math 0606

1. Nov/2023/Paper_0606/22/No.3

DO NOT USE A CALCULATOR IN THIS QUESTION.

A cylinder has base radius $(2+\sqrt{3})$ m and volume $\pi(16+9\sqrt{3})\text{m}^3$. Find the exact value of its height, giving your answer in its simplest form. [4]

2. March/2023/Paper_0606/22/No.2

DO NOT USE A CALCULATOR IN THIS QUESTION.

Expand and simplify $\left(\frac{x\sqrt{11}}{2\sqrt{3}-1}\right)^2$, giving your answer with a rational denominator. [4]

3. June/2023/Paper_0606/12/No.2

DO NOT USE A CALCULATOR IN THIS QUESTION.

Solve the equation $(2+\sqrt{5})x^2 = 4x+3(2-\sqrt{5})$, giving your answers in the form $a+b\sqrt{5}$ where a and b are integers. [5]

4. June/2023/Paper_0606/23/No.2

DO NOT USE A CALCULATOR IN THIS QUESTION.

Write the expression $\dfrac{\sqrt{98x^{12}}}{3+\sqrt{2}}$ in the form $\left(a\sqrt{b}+c\right)x^{d}$ where a, b, c and d are integers. [4]