SURDS

QUESTION 1

Simplify each of the following surds without using a calculator.

(a) $\sqrt{40}$ **(b)** $\sqrt{18}$ **(c)** $\sqrt{396}$

QUESTION 2

Simplify each of the following surds without using a calculator.

(a) $\sqrt{75}+\sqrt{108}$ **(b)** $\sqrt{32}+\sqrt{50}$ **(c)** $\left(3+5\sqrt{2}\right)\left(4-\sqrt{2}\right)$

QUESTION 3

Simplify each of the following surds without using a calculator.

(a) $\dfrac{2}{\sqrt{5}-3}$ **(b)** $\dfrac{10}{\sqrt{2}-5}$ **(c)** $\dfrac{8}{3\sqrt{7}-1}$

QUESTION 4

It is given that a and b are positive integers such that $\left(a\sqrt{5}-1\right)\left(\sqrt{5}+b\right)=20\sqrt{5}+32$. Form a pair of simultaneous equations and solve them to find the value of a and of b.

QUESTION 5

Solve $\sqrt{7x-5}-x-1=0$.

QUESTION 6

A rectangular block has a square base. The length of each side of the base is $\left(\sqrt{5}-\sqrt{3}\right)$ m and the volume of the block is $\left(4\sqrt{3}-2\sqrt{5}\right)$ m^3. Find, without the use of a calculator, the height of the block in the form of $a\sqrt{3}+b\sqrt{5}$.

QUESTION 7

A cylinder has a radius of $\left(\sqrt{2}-1\right)$ cm and a volume of $\left(12+4\sqrt{2}\right)\pi$ cm^3. Find, without using a calculator, the exact value of its height, h, in the form $\dfrac{a+b\sqrt{2}}{c}$ cm, where a, b and c are integers.