Topical Revision Paper 2

Term 1 Unit 2 Surds and Indices

Question 1:

Without using a calculator, simplify $\frac{3}{\left(2-\sqrt{5}\right)^2}-\frac{2}{\left(2+\sqrt{5}\right)^2}$. [3]

Answer : $9+20\sqrt{5}$

Question 2:

Solve for x $2(27^x)=45(3^x)+\frac{243}{3^x}$. [4]

Answer : $x=\frac{3}{2}$

Question 3:

The area of a rectangle *ABCD* is given by $\left(1+3\sqrt{2}\right)\text{m}^2$, and the length of side *AB* is $\left(2+\sqrt{8}\right)$ m. Find, without using a calculator, the length of side *BC* in the form of $(a+b\sqrt{2})$m, where *a* and *b* are real numbers. [4]

Answer :

Length of BC = $\left(\frac{5}{2}-\sqrt{2}\right)$ m

Question 4:

Without using a calculator, find the fractions, *a* and *b*, for which $\frac{6\sqrt{7}\ +\ \sqrt{5}}{4\sqrt{5}\ -\ \sqrt{7}}$ can be expressed as $a\ +\ b\sqrt{35}$. [3]

Answer : $a\ =\ \frac{62}{73}$ and $b\ =\ \frac{25}{73}$

Question 5:

(a) Without using a calculator, evaluate $2^0-\left|\frac{1}{7}-49^{\frac{1}{2}}\right|+(16)^{\frac{-1}{4}}$. [2]

(b) Given that $\frac{1}{27^{2x+1}}=243$, find the value of *x*. [2]

Answer : (a) $\frac{-75}{14}$ (b) $x=-\frac{4}{3}$

Question 6:

Solve for x, $13^{4x+2} - 4(169^{2x}) = 2145$. [4]

Answer :

$x = \frac{1}{4}$