S3A TOPICAL INTENSIVE REVISION WEEK 2

Total Marks: 30

Topic: Surds and Polynomials

1 Given that $\left(\frac{\sqrt{40}}{3}-\frac{1}{\sqrt{10}}\right)\left(\frac{30}{\sqrt{5}}\right)=k\sqrt{2}$, find the integer value of k. [4]

2 Solve the following equations.

(i) $\sqrt{5x+2}-\sqrt{3x-8}=0$ [2]

(ii) $\sqrt{7-6x}+x=-3x$ [3]

3 A rectangle has an area of $\left(8\sqrt{2}+7\sqrt{5}\right)$ cm^2 and a length of $\left(3\sqrt{2}+\sqrt{5}\right)$ cm.

Express in the form $a+b\sqrt{10}$, where a and b are integers,

(i) the breadth of the rectangle, [3]

(ii) the value of D^2, where D cm is the length of the diagonal of the rectangle. [3]

4 If $5x^3+Ax^2+x+3=(x+1)(Bx^2+Cx)+D$, find the values of A, B, C and D. [5]

5 Given that $f(x)=x^3+2x^2-17x+6$,

(i) Show that $x-3$ is a factor. [1]

(ii) solve the equation $f(x)=0$, giving your answers to 2 decimal places where appropriate. [4]

6 The function f is defined by $f(x)=2x^3+ax^2+bx-12$.

Given that $f(x)$ has a factor of $(x-3)$ and leaves a remainder of -14 when divided by $(2x+1)$,

(i) find the value of a and of b. [4]

(ii) find the remainder when $f(x)$ is divided by x. [1]

Answer Key

1	$k = 17$
2(i)	$x = 3$
2(ii)	$x = \frac{1}{2}$ (rej.) , $x = -\frac{7}{8}$
3(i)	$1+\sqrt{10}$
3(ii)	$34+8\sqrt{10}$
4	$A = 6, B = 5, C = 1, D = 3$
5(ii)	$x = 3, -5.37, 0.37$
6(i)	$a = -5, b = 1$
6(ii)	Remainder $= -12$