Polynomial Questions

Example and Explanation

(a) Show that $(2x + 1)(x + 3)(3x + 7)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are integers.

	$2x$	$+1$
x	$2x^2$	$+x$
$+3$	$+6x$	$+3$

	$2x^2$	$+7x$	$+3$
$3x$	$6x^3$	$+21x^2$	$+9x$
$+7$	$+14x^2$	$+49x$	$+21$

Multiply out the first (A) two brackets

$6x^3 + 35x^2 + 58x + 21$

$a = 6$
$b = 35$
$c = 58$
$d = 21$

Multiply the quadratic resulting from (A) by the remaining bracket.

Rearrange to give you $ax^2 + bx + c$ form

(3)

(b) Solve $(1-x)^2 < \frac{9}{25}$

$(1-x)(1-x) < \frac{9}{25}$

$\therefore 1 - x - x + x^2 < \frac{9}{25}$

$\therefore x^2 - 2x + 1 < \frac{9}{25}$

$\therefore x^2 - 2x + \frac{16}{25} < 0$

If you can equate one side of your equation to zero, you can multiply both sides by whatever you want!

$\therefore 25x^2 - 50x + 16 < 0$

$(5x - 8)(5x - 2) < 0$

$\frac{2}{5} < x < \frac{8}{5}$

(3)

If $(5x-8) = 0$, $x = \frac{8}{5}$

If $(5x-2) = 0$, $x = \frac{2}{5}$

Solve for x when $5x - 8 = 0$

(Total for question = 6 marks)

Q1

(a) Show that (2k+1)(k+3)(3k+7) can be written in the form $ak^3 + bk^2 + ck + d$ where a, b, c and d are integers.

(b) Solve $(1-k)^2 < \frac{9}{25}$

Q2

(a) Show that (8t+7)(3t-9)6t-8)can be written in the form $at^3 + bt^2 + ct + d$ where a, b, c and d are integers.

(b) Solve $(1 - t)^2 < \frac{4}{9}$

Q3

(a) Show that (5y+1)(y-7)(y+9) can be written in the form $ay^3 + by^2 + cy + d$ where a, b, c and d are integers.

(b) Solve $(1 - y)^2 < \frac{16}{49}$

Q4

(a) Show that(8p+9)(7p-12)(7p-13) can be written in the form $ak^3 + bk^2 + ck + d$ where a, b, c and d are integers.

(b) Solve $(1-p)^2 < \frac{25}{36}$

Knowledge Test

Complete the following table

n	n^2	n^3	n^3+n^2+n
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			