ALGEBRA (Q 2 & 3, PAPER 1)

2006

2 (a) Simplify $3(2x+4)-5(x+1)$.

(b) Let $f(x)=2x^3+ax^2+bx+14$.

(i) Express $f(2)$ in terms of a and b.

(ii) If $f(2)=0$ and $f(-1)=0$, find the value of a and the value of b.

(c) (i) Find the smallest natural number k such that
$2x+4(x+3)+7(2x+4)<20(x+k)$.

(ii) The lengths of the sides of a triangle are
$4\sqrt{x}$, $(x-4)$ and $(x+4)$, where $x>4$.
Prove that the triangle is right-angled.

3 (a) Find the value of $\dfrac{ab-c}{2}$ when $a=3$, $b=\frac{2}{3}$ and $c=1$.

(b) Solve for x and y

$x-2y=10$

$x^2+y^2=20$.

(c) Solve for x

$x=\dfrac{3+2x}{x-2}$, $x\neq 2$

and give your solutions in the form form $a\pm\sqrt{b}$, where $a,b\in\mathbf{N}$.
Write one of your solutions correct to two decimal places. Using this value, show that the difference between the values of the left hand side and the right hand side of the given equation is less that 0.1.

ANSWERS

2 (a) $x+7$

(b) (i) $4a+2b+30$ (ii) $a=-9$, $b=3$

(c) $k=3$

3 (a) $\frac{1}{2}$

(b) $x=2$, $y=-4$

(c) $2\pm\sqrt{7}$; $4\cdot65$, $-0\cdot65$