	Revision 2 for the A/B September Test	**40**
1	Write down and simplify the general term in the expansion of $\left(x+\frac{1}{x}\right)^{10}$ Hence or otherwise obtain the term independent of x	**3** **2**
2	Express $\frac{4x+17}{(x+3)^2}$ as a sum of partial fractions	**3**
3	Differentiate (a) $3\tan(\sin x)$ (b) $\sqrt{\ln 4x}$ (c) $\frac{\cos x}{x}, \quad x \neq 0$	**3** **3** **3**
4	Find the equation of the tangent to the curve $x^2+3xy+y^2=-1$ at the point $(-1,1)$	**6**
5	Given that $z=-1+2i$ is a root of the equation $z^3+z-10=0$. Obtain all the roots and plot these on an Argand Diagram	**5**
6	A geometric sequence has first term 80 and common ratio $\frac{1}{3}$ Calculate the sum to infinity of the associated geometric series	**2**
7	On a suitable domain $f(x)=\tan x$ (a) Show that the third derivative of $f(x)$ is given by $f'''(x)=2\sec^4 x+4\tan^2 x\sec^2 x$ (b) Hence obtain the Maclaurin expansion of $f(x)=\tan x$ up to and including the term in x^3	**3** **2**
8	Use the substitution $u=1+x^2$ to obtain $\int_0^1 \frac{x}{\sqrt{(1+x^2)}}\,dx$	**5**