Surname	
Other Names	
Candidate Signature	

Centre Number						Candidate Number				

Examiner Comments	

Total Marks

MATHEMATICS

A LEVEL QUESTION COMPILATION

CM

Questions on: Binomial Expansion (Rational Powers)

Instructions to candidates:

• In the boxes above, write your centre number, candidate number, your surname, other names and signature.

• Answer ALL of the questions.

• You must write your answer for each question in the spaces provided.

• You may use a calculator.

Information to candidates:

• Full marks may only be obtained for answers to ALL of the questions.

• The marks for individual questions and parts of the questions are shown in round brackets.

• There are 3 questions in this question paper. The total mark for this paper is 24.

Advice to candidates:

• You should ensure your answers to parts of the question are clearly labelled.

• You should show sufficient working to make your workings clear to the Examiner.

• Answers without working may not gain full credit.

© 2019 crashMATHS Ltd.

1 5 3 3 2 2 2 1 8 0 0 0 4

Do not write outside the box

1 (a) In ascending powers of x, find the first 4 terms in the binomial expansion of

$$(4+3x)^{-\frac{1}{2}}$$

up to and including the term in x^3. Give each term in its simplest form. **(5)**

(b) State the set of values of x for which the expansion is valid. **(1)**

Do not write outside the box

Question 1 continued

TOTAL 6 MARKS

Do not write outside the box

2

$$f(x) = \frac{1}{\sqrt{9-4x}}, \quad |x| < \frac{9}{4}$$

(a) Find, in ascending powers of x, the first 3 terms in the binomial expansion of $f(x)$, up to and including the term in x^2. Give each term in its simplest form. **(5)**

(b) Hence, find, in ascending powers of x, the first 3 terms in the binomial expansion of

(i) $g(x) = \frac{1}{\sqrt{9+4x}}, \quad |x| < \frac{9}{4}$ **(1)**

(ii) $h(x) = \frac{1}{\sqrt{9-x}}, \quad |x| < 9$ **(2)**

up to and including the term in x^2, simplifying each term.

Do not write outside the box

Question 2 continued

TOTAL 8 MARKS

Do not write outside the box

3 (a) Express $\dfrac{2x-3}{(x+1)^2(x-2)}$ in the form $\dfrac{A}{(x+1)}+\dfrac{B}{(x+1)^2}+\dfrac{C}{(x-2)}$, where A, B and C are rational numbers to be found. **(4)**

(b) In ascending powers of x, find the first 3 terms in the binomial expansion of

$$g(x)=\frac{2x-3}{(x+1)^2(x-2)}$$

up to and including the term in x^2. Give each term in its simplest form. **(5)**

(c) State the set of values of x for which your expansion in (b) is valid. **(2)**

Do not write outside the box

Question 3 continued

TOTAL 10 MARKS