

NAME \_\_\_\_\_ INDEX NUMBER \_\_\_\_\_

SCHOOL \_\_\_\_\_ DATE \_\_\_\_\_

## BINOMIAL EXPANSIONS

<i>KCSE 1989 – 2012 Form 3 Mathematics</i>	Working Space
<p>1. <b>1989 Q13 P2</b> Expand <math>\left[1 + \frac{1}{2}x\right]^8</math> up to term in <math>x^3</math> By putting <math>x = 0.1</math>, find the approximate value of <math>(1.05)^8</math> to 2 decimal places. (5marks)</p>	
<p>2. <b>1990 Q16 P2</b> Write down the first four terms of <math>(p + q)^8</math> using binomial expansion. Use your expansion to evaluate <math>(9.99)^8</math> the nearest 100 (4marks)</p>	
<p>3. <b>1991 Q16 P2</b> Obtain the binomial expansion for <math>(1-2x)^5</math>. Use your expansion to evaluate <math>(0.98)^5</math> to five places of decimal (3marks)</p>	

		Working Space
4.	<p><b>1992 Q3 P2</b></p> <p>Use binomial theorem to expand <math>\left[1 - \frac{1}{2}x\right]^8</math> up to the fourth term. Use your expansion to evaluate <math>(0.98)^8</math> by taking <math>x = 0.04</math> (3marks)</p>	
5.	<p><b>1993 Q7 P1</b></p> <p>By making use of binomial expansion, determine the value of <math>(2.002)^4</math> to four decimal places (3marks)</p>	
6.	<p><b>1994 Q5 P2</b></p> <p>Expand <math>(1 + 2x)^{10}</math> up to the term in <math>x^3</math>. Hence use our expansion to estimate <math>(0.95)^{10}</math> correct to three decimal places (4marks)</p>	
7.	<p><b>1996 Q12 P2</b></p> <p>Expand <math>(1+a)^5</math> use your expansion to estimate <math>(0.8)^5</math> correct to four decimal places (3marks)</p>	

		Working Space
8.	<p><b>1997 Q9 P2</b></p> <p>Expand and simplify <math>(1 - 3x)^5</math>, up to the term in <math>x^3</math></p> <p>Hence use your expansion to estimate <math>(0.97)^5</math> correct to 4 decimal places</p>	
9.	<p><b>1998 Q13</b></p> <p>(a) Write down the simplest expansion <math>(1 + x)^6</math></p> <p>(b) Use the expansion up to the fourth term to find the value of <math>(1.03)^6</math> to the nearest one thousandth.</p>	
10	<p><b>1999 Q10</b></p> <p>Use binomial expression to evaluate <math>(0.96)^5</math> correct to 4 significant figures</p>	

		Working Space
11	<p><b>2000 Q13</b>  Expand <math>(1 + x)^5</math>, hence, use the expansion to estimate <math>(1.04)^5</math> correct to 4 decimal Places</p>	
12	<p><b>2001 Q10 P2</b>  Expand <math>(2 + x)^5</math> in ascending powers of x up to the term in <math>x^3</math>. Hence, approximate the value of <math>(2.03)^5</math> to 4s.f.</p>	
13	<p><b>2002 Q9 P2</b>  a) Expand <math>(a - b)^6</math>  b) Use the first three term of the expansion in a (a) to find the approximate value of <math>(1.98)^6</math></p>	

		Working Space
14	<p><b>2003 Q11 P2</b></p> <p>a) Expand and simplify the binomial expression <math>(2 - x)^6</math> (2marks)</p> <p>b) Use the expansion up to the term in <math>x^2</math> to estimate <math>1.99^6</math> (2marks)</p>	
15	<p><b>2004 Q8 P2</b></p> <p>(a) Expand <math>(1 + x)^5</math></p> <p>(b) Use the first three terms of the expansion in (a) to find the approximate value of <math>(0.98)^5</math></p>	
16	<p><b>2005 Q13 P2</b></p> <p>Expand and simplify <math>(3x - y)^4</math></p> <p>Hence use the first three terms of the expansion to approximate the value of <math>(6-0.2)^4</math> ( 4 marks)</p>	

		Working Space
17	<p><b>2006 Q11 P2</b></p> <p>Use binomial expression to evaluate ( 4 marks)</p> $\left(2 + \frac{1}{\sqrt{2}}\right)^5 + \left(2 - \frac{1}{\sqrt{2}}\right)^5$	
18	<p><b>2007 Q4 P2</b></p> <p>(a) Expand the expression <math>\left(1 + \frac{1}{2}x\right)^5</math> in ascending powers of x, leaving the coefficients as fractions in their simplest form ( 2 marks)</p> <p>(b) Use the first three terms of the expansion in (a) above to estimate the value of <math>\left(1\frac{1}{20}\right)^5</math> ( 2 marks)</p>	
19	<p><b>2008 Q8 P2</b></p> <p>a) Expand and simplify the expression <math>\left(10 + \frac{2}{x}\right)^5</math> (2marks)</p> <p>b) Use the expansion in (a) above to find the value of <math>14^5</math> (2marks)</p>	

		Working Space
20	<p><b>2009 Q8 P2</b></p> <p>(a) Expand and simplify the binomial expression <math>(2 - x)^7</math> in ascending powers of <math>x</math> (2 marks)</p> <p>(b) Use the expansion up to the fourth term to evaluate <math>(1.97)^7</math> correct to 4 decimal places (2 marks)</p>	
21	<p><b>2010 Q12 P2</b></p> <p>a) Expand and simplify <math>(2 - x)^5</math> (2 marks)</p> <p>b) Use the first 4 terms of the expression in part (a) above to find the approximate value of <math>(1.8)^5</math> to 2 decimal places.</p>	

		Working Space
22	<p><b>2011 Q11 P2</b>  Expand and simplify the expression.  <math>(a + \frac{1}{2})^4 + (a - \frac{1}{2})^4</math> (3marks)</p>	
23	<p><b>2012 Q12 P2</b></p> <p>(a) Expand <math>(1+ x)^7</math> up to the 4<sup>th</sup> term. (1 mark)</p> <p>(b) Use the expansion in part (a) above to find the appropriate value of <math>(0.94)^7</math>. (2 marks)</p>	