

# BINOMIAL EXPANSIONS

KCSE 1989 – 2012 Form 3 Mathematics

1.	<b>1989 Q13 P2</b> Expand $\left[1 + \frac{1}{2}x\right]^8$ up to term in $x^3$ By putting $x = 0.1$ , find the approximate value of $(1.05)^8$ to 2 decimal places. (5marks)
2.	<b>1990 Q16 P2</b> Write down the first four terms of $(p + q)^8$ using binomial expansion. Use your expansion to evaluate $(9.99)^8$ the nearest 100 (4marks)
3.	<b>1991 Q16 P2</b> Obtain the binomial expansion for $(1-2x)^5$ . Use your expansion to evaluate $(0.98)^5$ to five places of decimal (3marks)
4.	<b>1992 Q3 P2</b> Use binomial theorem to expand $\left[1 - \frac{1}{2}x\right]^8$ up to the fourth term. Use your expansion to evaluate $(0.98)^8$ by taking $x = 0.04$ (3marks)
5.	<b>1993 Q7 P1</b> By making use of binomial expansion, determine the value of $(2.002)^4$ to four decimal places (3marks)
w 6.	<b>1994 Q5 P2</b> Expand $(1 + 2x)^{10}$ up to the term in $x^3$ . Hence use our expansion to estimate $(0.95)^{10}$ correct to three decimal places (4marks)
7.	<b>1996 Q12 P2</b> Expand $(1+a)^5$ use your expansion to estimate $(0.8)^5$ correct to four decimal places (3marks)
8.	<b>1997 Q9 P2</b> Expand and simplify $(1 - 3x)^5$ , up to the term in $x^3$ Hence use your expansion to estimate $(0.97)^5$ correct to 4 decimal places

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>
11	<p><b>2000 Q13</b></p> <p>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></p> <p>Expand <math>(2 + x)^5</math> in ascending powers of <math>x</math> 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></p> <p>a) Expand <math>(a - b)^6</math></p> <p>b) Use the first three term of the expansion in a (a) to find the approximate value of <math>(1.98)^6</math></p>
14	<p><b>2003 Q11 P2</b></p> <p>a) Expand and simplify the binomial expression <math>(2 - x)^6</math> (2mks)</p> <p>b) Use the expansion up to the term in <math>x^2</math> to estimate <math>1.99^6</math> (2mks)</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>
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 3\sqrt{\frac{83.46 \times 0.0054}{1.56^2}}</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> (2mks)</p> <p>b) Use the expansion in (a) above to find the value of <math>14^5</math> (2mks)</p>
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 x (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>
22	<p><b>2011 Q11 P2</b></p> <p>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>