Algebra and Functions 3

6 Describe what happens to the curve $y = x^3$ to transform it into the curve $y = (x - 4)^3$.

....

....

(2 marks)

7 Use the binomial expansion formula to find the coefficients.

a) Write down the first four terms in the expansion of $(1 + ax)^{10}$, $a > 0$, in ascending powers of x.

....

(4 marks)

b) Find the coefficient of x^2 in the expansion of $(2 + 3x)^5$.

....

(2 marks)

c) If the coefficients of x^2 in both expansions are equal, find the value of a.

$a = $ ....

(2 marks)

8 Find the coefficients of x, x^2 and x^3 in the binomial expansion of $(4 + 3x)^9$.

...., ..., ...

(4 marks)

Algebra and Functions 3

9   Binomial expansions can be used to estimate values of powers.

    a)   Find the first 3 terms of the expansion of $\left(1 + \frac{x}{3}\right)^8$ in ascending powers of x.
            Give each term in its simplest form.

          ....

                                  (3 marks)

    b)   Hence estimate the value of $(1.002)^8$ to 4 decimal places.

                          ....

                                    (3 marks)

10   This question is about the expansion of $(1 + 3x)^6$.

    a)   Find, in ascending powers of x, the first three terms of the expansion of $(1 + 3x)^6$,
            giving each term in its simplest form.

          ....

                                    (3 marks)

    b)   Assuming x is small so that x^3 and higher powers can be ignored, show that

$$(1 - 2x)(1 + 3x)^6 \approx 1 + 16x + 99x^2$$

                                    (2 marks)

EXAM TIP   It doesn't matter what your preferred format for writing out the coefficients in the binomial expansion is — using the formula or using Pascal's triangle. As long as the examiner can understand what you've put down, and you've got each one correct, you should get full marks. That's not a license to scribble down any old nonsense though, it still has to be right...

Score

51