1. (a) Expand and simplify $(1 - b)^3$ in ascending powers of b.   (2 marks)

    (b) By using a suitable substitution for b, show that

    $$1 - 3\sin^2 x + 3\sin^4 x - \sin^6 x = \cos^6 x$$ (3 marks)

Mark scheme:

1. (a) $(1-b)^3$

   An attempt to use the binomial theorem or simply multiplying   (M1)

   $(1-b)^3 = 1 - 3b + 3b^2 - b^3$ (A1)

   (b) $If\ b = \sin^2 x$ (A1)

   $1 - 3\sin^2 x + 3\sin^4 x - \sin^6 x = (1 - \sin^2 x)^3$

   $(1 - \sin^2 x)^3 = (\cos^2 x)^3$ (M1)

   $(\cos^2 x)^3 = \cos^6 x$ (A1)