1. 1. If x + 1/x = 1, then the value of (x^4 + 5x^3 + 7x^2 + 5x + 1)/(x^4 + 11x^3 + 25x^2 + 11x + 1) is  
   (A) 1/3  
   (B) 1/4  
   (C) 2/5  
   (D) 3/8
2. 2. If x + 1/x = −2, evaluate (x^2 + 4x + 1)/(x^2 − 2x + 1).  
   (A) −1  
   (B) 0  
   (C) 1  
   (D) 2
3. 3. If x + 1/x = t with t ≠ ±2, find (x^2 + x + 1)/(x^2 − x + 1) in terms of t.  
   (A) (t + 1)/(t − 1)  
   (B) (t^2 + t − 1)/(t^2 − t − 1)  
   (C) (t + 2)/(t − 2)  
   (D) (t^2 + 3)/(t^2 − 1)
4. 4. If x + 1/x = 3, compute (x^3 + 3x^2 + 3x + 1)/(x^3 + x^2 + x + 1).  
   (A) 3/2  
   (B) 5/3  
   (C) 7/4  
   (D) 2
5. 5. If x + 1/x = −1, then the value of (x^6 − 3x^3 + 1)/(x^6 + 3x^3 + 1) is  
   (A) −1  
   (B) −1/2  
   (C) 1/2  
   (D) 2
6. 6. Let x + 1/x = k (k ≠ ±2). Evaluate (x^4 + 1)/(x^2 + 1) in terms of k.  
   (A) k^2 − 1  
   (B) (k^2 + 2)/2  
   (C) (k^2 − 2)/2  
   (D) k^2/2
7. 7. If x + 1/x = 4, find (x^5 + 1/x^5).  
   (A) 252  
   (B) 248  
   (C) 244  
   (D) 236
8. 8. If x + 1/x = 2cosθ with θ ∈ (0, π), evaluate (x^2 − 1)/(x^2 + 1).  
   (A) tan(θ/2)  
   (B) −tan(θ/2)  
   (C) cosθ  
   (D) sinθ
9. 9. If x + 1/x = 7, then the value of (x^3 − 1)/(x − 1) is  
   (A) 85  
   (B) 91  
   (C) 98  
   (D) 112

10. If x + 1/x = m (m ≠ ±2) and y = x − 1/x, then evaluate (y^4 + 4)/(y^2 + 2) in terms of m.  
(A) m^2  
(B) m^2 − 2  
(C) m^2 + 2  
(D) m^2 − 4