MM 45 **cbsemath.com** Time 1h 30 min

Which of the following are not polynomials and why?

1. $\sqrt{3}x^2 + 5x - 11$ 3

2. $5\sqrt{x - 11}$ 3

3. Is $\dfrac{\sqrt{3}x^2 + 5x - 11}{3\sqrt{x} + 9}$ a rational expression? Why? 3

Reduce the following rational expression into lowest terms

4. $\dfrac{(x^2 - 4)(x^2 - 8x + 7)}{(x - 2)(x^2 - 6x - 7)}$ 4

5. $\dfrac{x^3 - 7x - 6}{x^3 - 5x^2 - 2x + 24}$. 4

Simplify the following

6. $\left\{\dfrac{x}{x^4 + x^2 + 1} + \dfrac{1}{x^2 + x + 1}\right\} + \left\{\dfrac{x}{x^4 + x^2 + 1} - \dfrac{1}{x^2 - x + 1}\right\}$. 4

7. $\dfrac{x + 3}{2x^2 + 9x + 9} + \dfrac{1}{2(2x - 3)} - \dfrac{4x}{4x^2 - 9}$. 4

8. $\dfrac{x^3 - 8}{x^2 - 4} \times \dfrac{x^2 6x + 8}{x^2 - 2x + 1} + \dfrac{x^2 + 2x + 4}{x^2 + 2x - 3}$. 4

9. $\dfrac{1}{x + a} + \dfrac{1}{x + a} + \dfrac{1}{x + c} + \dfrac{a}{x^2 + ax} + \dfrac{b}{x^2 + bx} + \dfrac{c}{x^2 + cx}$. 4

10. $\dfrac{x}{(x - y)(x - z)} + \dfrac{y}{(y - z)(y - x)} + \dfrac{z}{(z - x)(z - y)}$ 4

11. What rational expression should be added to $\dfrac{x^3 - 1}{x^2 + 2}$ to get multiplicative inverse of $\dfrac{x^2 + 2}{2x^3 - x^2 + 3}$. 4

12. Simplify $\dfrac{x^3 + y^3}{(x - y)^2 + 3xy} \div \dfrac{(x + y)^2 - 3xy}{x^3 - y^3} \times \dfrac{xy}{x^2 - y^2}$ 4