

C Level Questions

1. Simplify each polynomial expression. Write the solution in Standard Form:

a. $(4x^3 - 10x^2 + 2x - 7) + (3 - 2x - 5x^2 - 7x^3)$

b. $(4x^3 - 10x^2 + 2x - 7) - (3 - 2x - 5x^2 - 7x^3)$

c. $(2x - 7)(3x^2 - 5x + 1)$

d. $\frac{6x^3 - 29x^2 + 32x - 14}{2x - 7}$

2. Simplify each rational expression fully.

a. $\frac{4x}{x+1} + \frac{4}{x+1}$

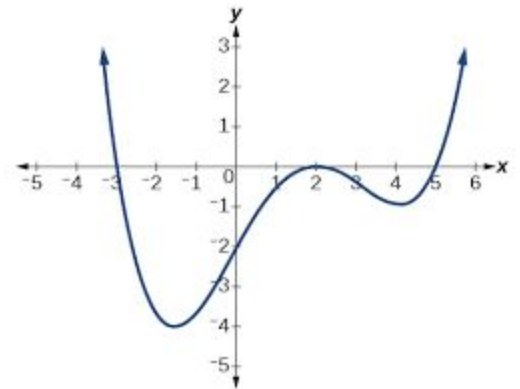
b. $\frac{x^2}{x-1} - \frac{1}{x-1}$

c. $\frac{2}{2x-2} \cdot \frac{x-1}{x+3}$

3. Write a polynomial function in Factored Form for each description below:

a. x-intercepts at (3,0), (4,0), (5,0) and a degree of 5.

b.

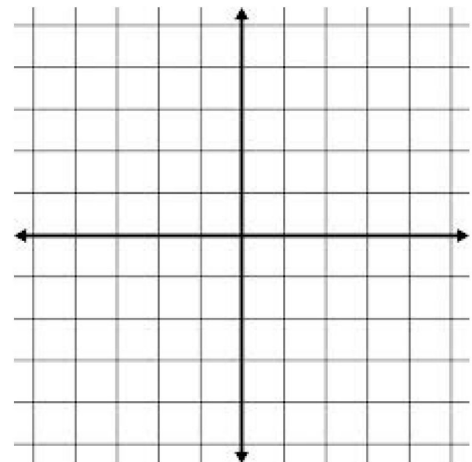


4. a. Factor $t(x) = (x^2 + 2x + 1)(x^2 - 1)$.

b. Identify the x-intercepts and state the multiplicity of each root.

c. Use the x-intercepts and multiplicities to sketch the graph of $t(x)$.

d. Describe what happens to $t(x)$ when $x \rightarrow -\infty$ and when $x \rightarrow \infty$.



A/B Level Questions

5. The polynomial $m(x) = a(x - b)^2(x - c)$ has a leading coefficient of 10, a constant of 120 and the root with multiplicity one is 3. Find a, b, and c.

6. Consider the function $p(x) = -2x^6$. Explain why $p(x) < 0$ when $x \rightarrow \infty$ and $p(x) < 0$ when $x \rightarrow -\infty$.

7. a. Show that $(x + 1)^2 = x^2 + 2x + 1$

b. Show that $(2x + 2)^2 = 4x^2 + 8x + 4$

c. Hence, what does $(3x + 3)^2 = ?$

d. Hence, what does $\frac{a^2x^2 + 2a^2x + a^2}{ax + a} = ?$

8. Solve the equation $\frac{2}{x+1} - \frac{1}{x-1} = 0$ for x. Check your solution(s).