Honors Algebra II
Unit 4A – Polynomial Functions (Graphs)

Name AK
WS – Characteristics of Polynomial Functions

For each polynomial function, identify the given characteristics. Then sketch a possible graph of the polynomial.

1. $f(x)=x(x-1)^3$

Degree: 4

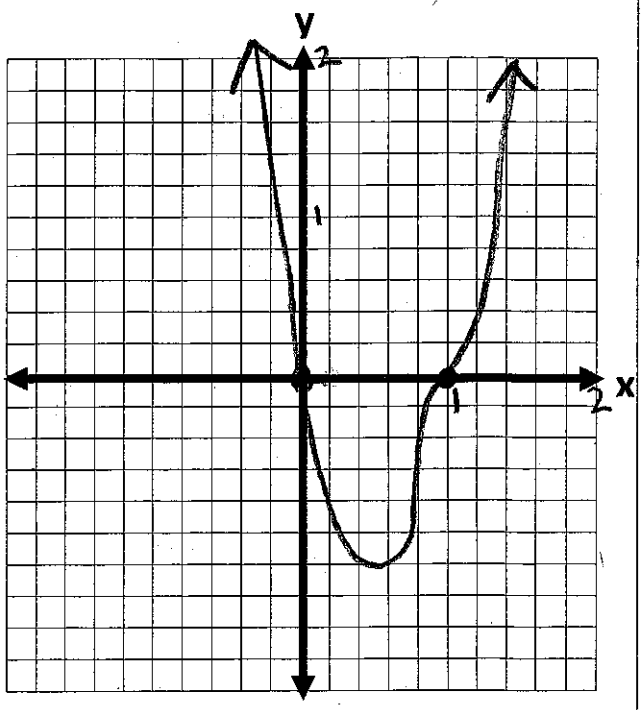
y-intercept: (0,0)

maximum number of turns: 3

sign of leading coefficient: +

end behavior: As $x \to -\infty$, $f(x) \to \infty$
As $x \to \infty$, $f(x) \to \infty$

Real Zeros: $x=0$ (mult 1), $x=1$ (mult 3)




2. $f(x)=x^3(x-3)^2(x+4)$

Degree: 6

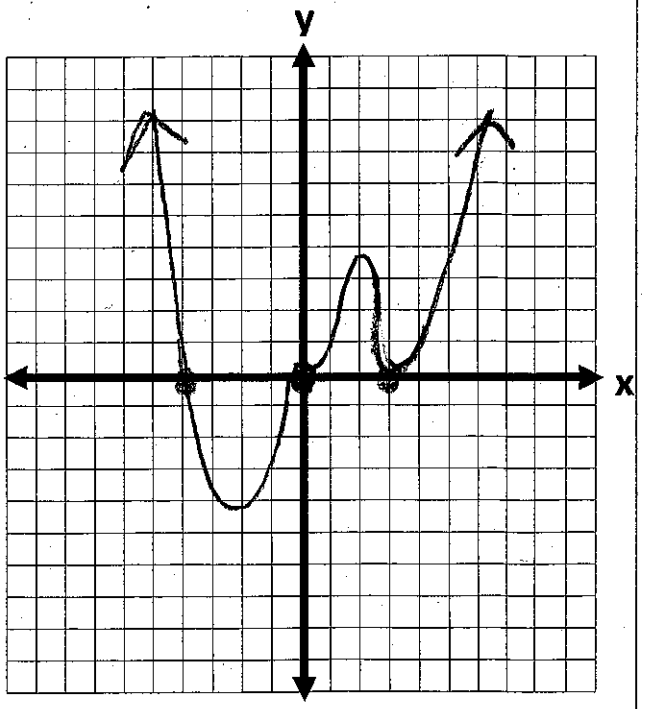
y-intercept: (0,0)

maximum number of turns: 5

sign of leading coefficient: +

end behavior: As $x \to -\infty$, $f(x) \to \infty$
As $x \to \infty$, $f(x) \to \infty$

Real Zeros: $x=0$ (mult 3), $x=3$ (mult 2), $x=-4$ (mult 1)



3. $f(x)=-2(x-6)(x-2)(x+3)^2(x+7)^3$

Degree: 7

y-intercept: (0, -74088)

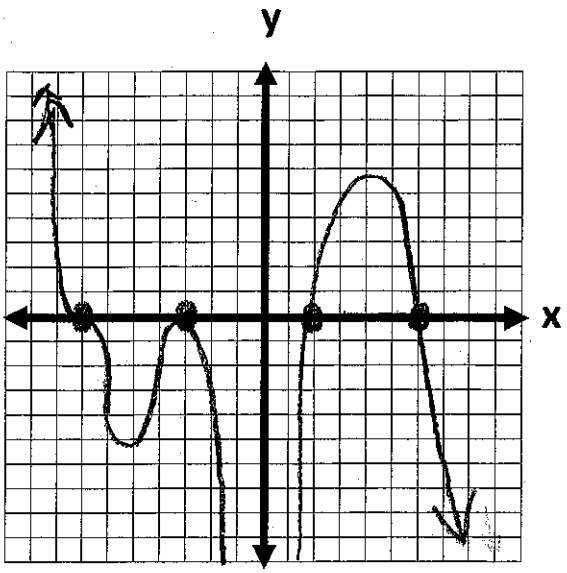
maximum number of turns: 6

sign of leading coefficient: −

end behavior: As $x \to -\infty$, $f(x) \to \infty$

As $x \to \infty$, $f(x) \to -\infty$

Zeros: $x=6$ (mult. 1), $x=2$ (mult. 1), $x=-3$ (mult. 2), $x=-7$ (mult. 3)




4. $f(x)=-3(x+1)^4(x-5)^2(x-2)(x+7)$

Degree: 8

y-intercept: (0, 1050)

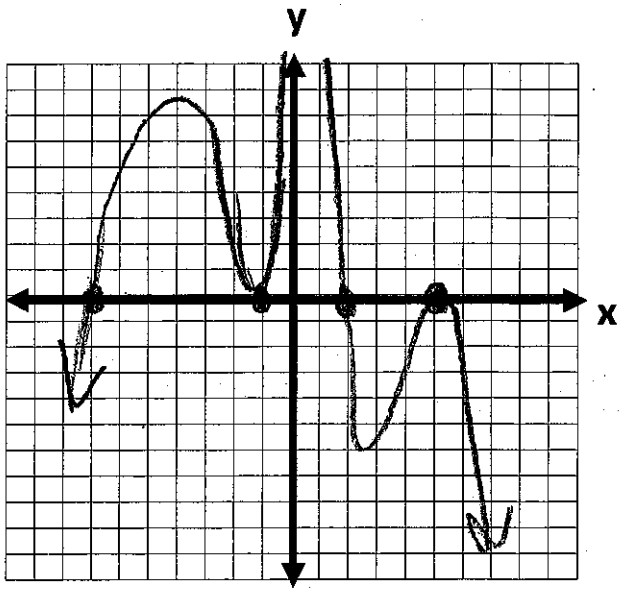
maximum number of turns: 7

sign of leading coefficient: −

end behavior: As $x \to -\infty$, $f(x) \to -\infty$

As $x \to \infty$, $f(x) \to -\infty$

Real Zeros: $x=-1$ (mult. 4), $x=5$ (mult. 2), $x=2$, $x=-7$




5. $g(x)=x^2(x-4)(x+6)(x-9)^3(x+1)^2$

Degree: 9

y-intercept: (0, 0)

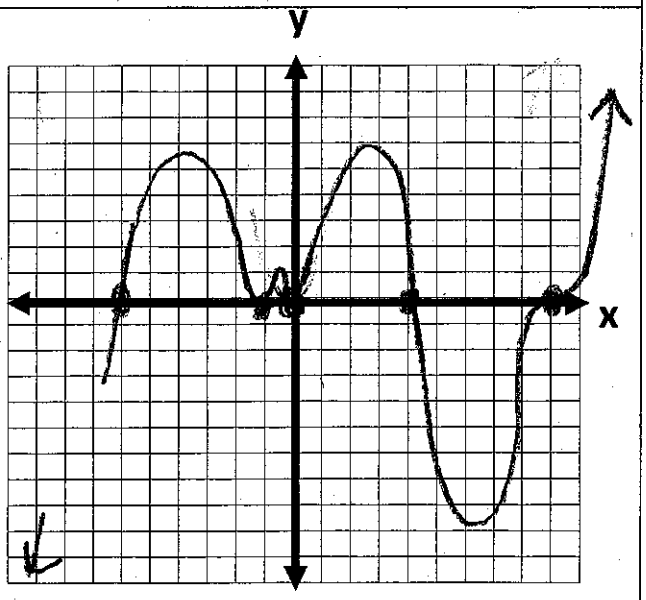
maximum number of turns: 8

sign of leading coefficient: +

end behavior: As $x \to -\infty$, $g(x) \to -\infty$

As $x \to \infty$, $g(x) \to +\infty$

Real Zeros: $x=0$ (m. 2), $x=4$, $x=-6$, $x=9$ (m. 3)




$x=-1$, m. 2