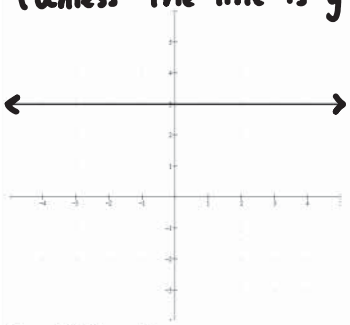
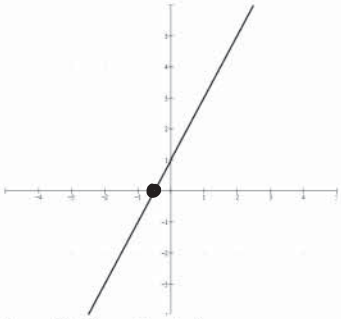
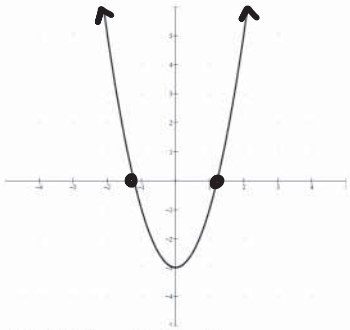
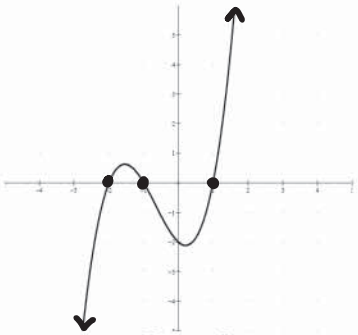
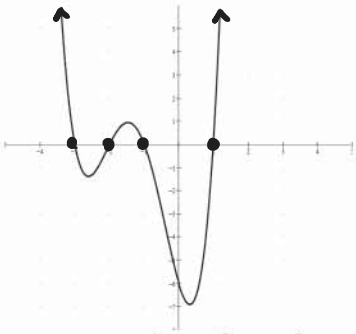
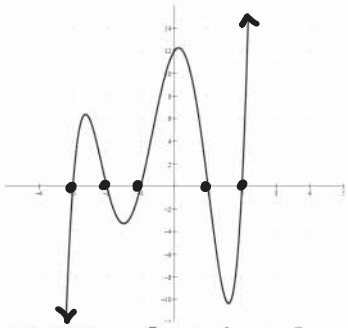
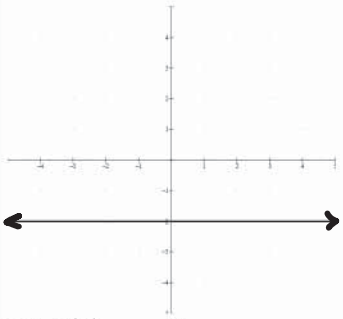
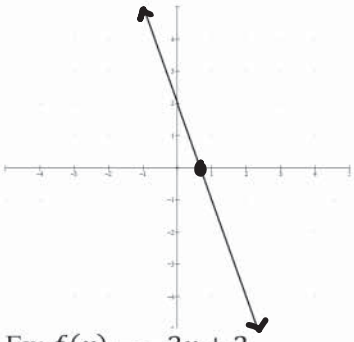
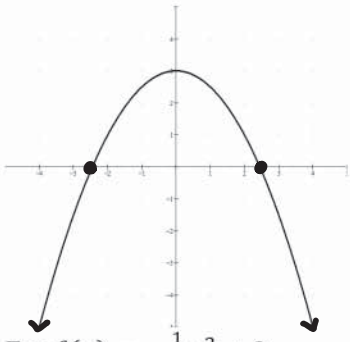
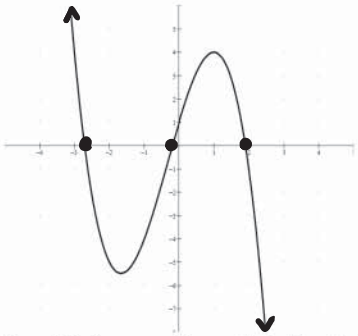
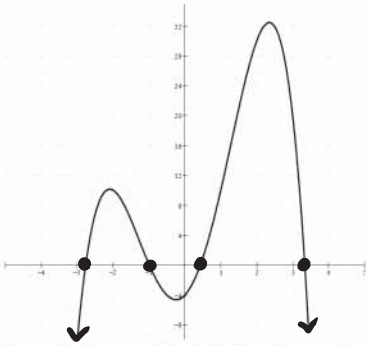
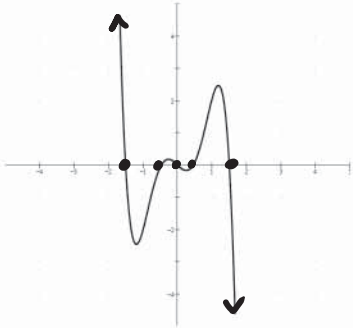
Polynomial Characteristics

Degree 0: constant Leading Coefficient: N/A Maximum # of x-intercepts: 0 (unless the line is $y=0$)  Ex: $f(x) = 3$ End Behavior: horizontal line	Degree 1: linear Leading Coefficient: + Maximum # of x-intercepts: 1  Ex: $f(x) = 2x + 1$ End Behavior: down in quad III up in quad I	Degree 2: quadratic Leading Coefficient: + Maximum # of x-intercepts: 2  Ex: $f(x) = 2x^2 - 3$ End Behavior: up in quad II up in quad I
Degree 3: cubic Leading Coefficient: + Maximum # of x-intercepts: 3  Ex: $f(x) = x^3 + 2x^2 - x - 2$ End Behavior: down in quad III up in quad I	Degree 4: quartic Leading Coefficient: + Maximum # of x-intercepts: 4  Ex: $f(x) = x^4 + 5x^3 + 5x^2 - 5x - 6$ End Behavior: up in quad II up in quad I	Degree 5: quintic Leading Coefficient: + Maximum # of x-intercepts: 5  Ex: $f(x) = x^5 + 3x^4 - 5x^3 - 15x^2 + 4x + 12$ End Behavior: down in quad III up in quad I

Degree 0: constant Leading Coefficient: N/A Maximum # of x-intercepts: 0  Ex: $f(x) = -2$ End Behavior: horizontal line	Degree 1: linear Leading Coefficient: − Maximum # of x-intercepts: 1  Ex: $f(x) = -3x + 2$ End Behavior: up in quad II down in quad IV	Degree 2: quadratic Leading Coefficient: − Maximum # of x-intercepts: 2  Ex: $f(x) = -\frac{1}{2}x^2 + 3$ End Behavior: down in quad III down in quad IV
Degree 3: cubic Leading Coefficient: − Maximum # of x-intercepts: 3  Ex: $f(x) = -x^3 - x^2 + 5x + 1$ End Behavior: up in quad II down in quad IV	Degree 4: quartic Leading Coefficient: − Maximum # of x-intercepts: 4  Ex: $f(x) = -x^4 + 10x^2 + 5x - 4$ End Behavior: down in quad III down in quad IV	Degree 5: quintic Leading Coefficient: − Maximum # of x-intercepts: 5  Ex: $f(x) = -2x^5 + 5x^3 - x$ End Behavior: up in quad II down in quad IV

★ even-numbered degrees have same end behavior
→ use $y = x^2$ and $y = -x^2$ as a guide

★ odd-numbered degrees have same end behavior
→ use $y = x$ and $y = -x$ as a guide