

Name: _____

Date: _____

Complete the following table using each polynomial function:

| Function | Degree | End Behavior | Domain |
|---------------------------------------|--------|---|--------|
| 1. $f(x) = x^3 - x^2 - 8x + 12$ | | As $x \rightarrow \infty$ $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ | |
| 2. $f(x) = 3x^3 - 12x + 4$ | | As $x \rightarrow \infty$ $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ | |
| 3. $f(x) = -2x^3 + 4x^2 + x - 2$ | | As $x \rightarrow \infty$ $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ | |
| 4. $f(x) = x^4 + 5x^3 + 5x^2 - x - 6$ | | As $x \rightarrow \infty$ $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ | |
| 5. $f(x) = x^4 + 2x^3 - 5x^2 - 6x$ | | As $x \rightarrow \infty$ $f(x) \rightarrow$ _____ As $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ | |

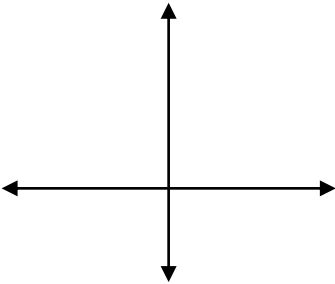
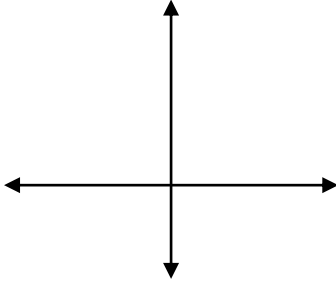
Use the equations to answer the following:

| Function | Degree | Max # of Extrema |
|---------------------------------------|--------|------------------|
| 6. $f(x) = x^3 - x^2 - 8x + 12$ | | |
| 7. $f(x) = 3x^3 - 12x + 4$ | | |
| 8. $f(x) = -2x^3 + 4x^2 + x - 2$ | | |
| 9. $f(x) = x^4 + 5x^3 + 5x^2 - x - 6$ | | |
| 10. $f(x) = x^4 + 2x^3 - 5x^2 - 6x$ | | |

Determine the end behavior and maximum number of extrema (u-turns) w/o calculator:

| | |
|--|--|
| $f(x) = -8x^5 - 7x^3 + 3x - 7$ 11. $x \rightarrow +\infty$ $f(x) \rightarrow$ _____ extrema _____ $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ | $f(x) = 12 - 3x^3 + 5x^3 - 7x^4$ 12. $x \rightarrow +\infty$ $f(x) \rightarrow$ _____ extrema _____ $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ |
| $f(x) = 1 - 3x - 2x^2 - 5x^3 + 7x^4 - 12x^5$ 13. $x \rightarrow +\infty$ $f(x) \rightarrow$ _____ extrema _____ $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ | $f(x) = -7x^3 + 343$ 14. $x \rightarrow +\infty$ $f(x) \rightarrow$ _____ extrema _____ $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ |

Find the number of zeros, y-int, & end behavior. Sketch the graph:

| | |
|--|--|
| 15. $x^4 - 13x^2 + 36 = 0$ given zeros: $-3, -2, 2, 3$  # of Zeros: _____ Y-Int: _____ $x \rightarrow +\infty$ $f(x) \rightarrow$ _____ $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ max # of extrema _____ | 16. $x^3 - x^2 - 16x + 16 = 0$ given zeros: $-4, 1, 4$  # of Zeros: _____ Y-Int: _____ $x \rightarrow +\infty$ $f(x) \rightarrow$ _____ $x \rightarrow -\infty$ $f(x) \rightarrow$ _____ max # of extrema _____ |
|--|--|