

Group #: _____ Name: _____

1. (10 points each) Solve the following nonlinear inequalities. Express the solution using interval notation and graph the solution set.

(a) $(x - 5)(x - 2)(x + 1) > 0$

(b) $(x + 3)^2(x + 1) > 0$

(c) $16x \leq x^3$

(d) $x^2 \leq 49$

2. (10 points each) (a) Describe the end behaviors of the following polynomial functions. (b) Match the polynomial functions with one of the graphs I-VI using the end behaviors. Since you are matching based on end behaviors only, there might be multiple graphs that share the same end behavior. Similarly, you might use the same graph more than once.

(a) $P(x) = x(x^2 - 3)$

(b) $Q(x) = -x^2(x^2 - 3)$

(c) $R(x) = -x^5 + 5x^3 - 3x$

(d) $S(x) = \frac{3}{2}x^6 - 4x^4$

(e) $T(x) = x^4 + 3x^3$

(f) $U(x) = -x^3 + 3x^2$

