Name: _____ Date: _____ **Unit 6 Homework**

"End Behavior" of Polynomials Homework

Describe and sketch the end behavior of each of the polynomials below.

1. $f(x) = 9x^6 - 8x^2 + 4$

2. $g(x) = -7 - 8x^5 - 2x$

3. $h(x) = -3x - 10$

4. $p(x) = x^3 + x$

5. $r(x) = (h \circ g)(x)$

6. $n(x) = h(x)f(x)$

7. $m(x) = 6x^2 - 4x^3$

8. $j(x) = m(x)p(x)$

9. Write the equation for any polynomial for which the following end behavior applies: as $x \to -\infty, f(x) \to -\infty$ and as $x \to \infty, f(x) \to \infty$.

10. Write the equation for any polynomial for which the following end behavior applies: as $x \to -\infty, f(x) \to -\infty$ and as $x \to \infty, f(x) \to -\infty$.

Solutions on next page… ☺

1. positive leading coefficient, even degree
up / both ends the same
as $x \to -\infty, f(x) \to \infty$ and as $x \to \infty, f(x) \to \infty$

2. negative leading coefficient, odd degree
up to left, down to right / both ends opposite
as $x \to -\infty, f(x) \to \infty$ and as $x \to \infty, f(x) \to -\infty$.

3. negative leading coefficient, odd degree
up to left, down to right / both ends opposite
as $x \to -\infty, f(x) \to \infty$ and as $x \to \infty, f(x) \to -\infty$.

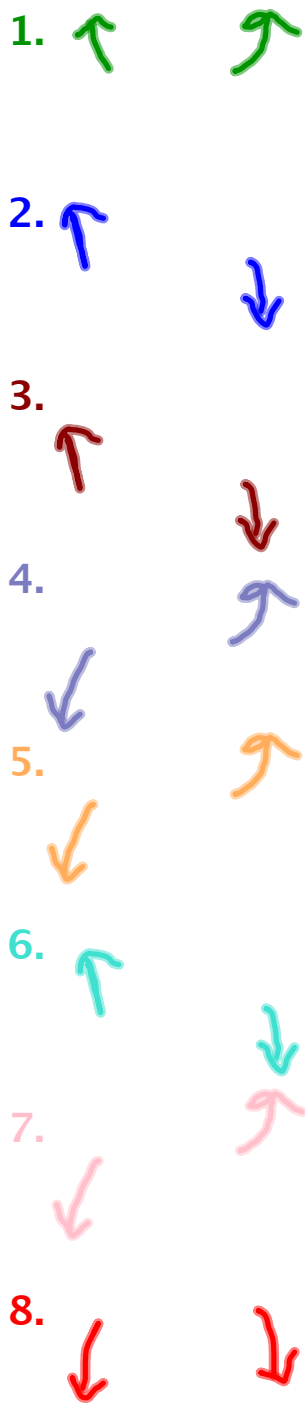
4. positive leading coefficient, odd degree
up / both ends opposite
as $x \to -\infty, f(x) \to -\infty$ and as $x \to \infty, f(x) \to \infty$.

5. $24x^5 + 6x + 11$
positive leading coefficient, odd degree
up / both ends opposite
as $x \to -\infty, f(x) \to -\infty$ and as $x \to \infty, f(x) \to \infty$.

6. leading term: $-27x^7$
negative leading coefficient, odd degree
up to left, down to right / both ends opposite
as $x \to -\infty, f(x) \to \infty$ and as $x \to \infty, f(x) \to -\infty$.

7. negative leading coefficient, odd degree
up to left, down to right / both ends opposite
as $x \to -\infty, f(x) \to \infty$ and as $x \to \infty, f(x) \to -\infty$.

8. leading term: $-4x^6$
negative leading coefficient, even degree
down / both ends the same
as $x \to -\infty, f(x) \to -\infty$ and as $x \to \infty, f(x) \to -\infty$



9. will vary; highest exponent must be odd & coefficient of this term must be positive

10. will vary; highest exponent must be even & coefficient of this term must be negative