

**1.4 Understanding the Relationship Between  
Zeros and Factors of Polynomials,  
End Behaviors**

SCORE:

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Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Solve by factoring.**

1.  $0 = 2x^2 - 8x + 6$

2.  $x^3 - 36x = 0$

**For the given polynomials determine which of the binomials listed are factors. Use the remainder theorem. Show work!**

3.  $f(x) = 2x^2 - 8x + 6$

4.  $f(x) = x^2 + 9x$

a)  $x + 1$

a)  $x - 3$

b)  $x - 1$

b)  $x + 9$

**For the given polynomials determine which of the given values are solutions. Use the remainder theorem. Show work!**

5.  $f = x^3 - x^2 - 5x - 3$

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

a)  $x = -1$

a)  $x = 2$

b)  $x = 3$

b)  $x = -1$

Without graphing, determine the number of zeros for each of the following polynomials.

7.  $f(x) = 2x^2 - 8x + 6$

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

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

10.  $f(x) = -x^7 + 27$

11.  $f(x) = -x^4 - 8x^3 - 2x^2 + 3x - 5$

12.  $f(x) = -8x + 6$

Without graphing, state the degree of the polynomial and determine whether it is even or odd, then write the end behavior as a limit. Write your own limit notation on 15 and 16.

13.  $f(x) = 2x^2 - 8x + 6$

degree:

Is the degree even or odd:

$$\lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow \infty} f(x) =$$

14.  $f(x) = x^5 + 3x^4 - 2x^3 - 5x^2 - 10x + 1$

degree:

Is the degree even or odd:

$$\lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow \infty} f(x) =$$

15.  $f(x) = -x^3 - x^2 - 5x - 3$

degree:

Is the degree even or odd:

16.  $f(x) = -x^4 + 3x - 10$

degree:

Is the degree even or odd:

**Review Problems**

**Factor the following polynomials. Use polynomial identities if necessary. Show work!**

17.  $x^3 + 13x^2 + 42x$

18.  $6az^2 - 2ac + 9bz^2 - 3bc$

19.  $64x^2 - 1$

20.  $m^2 - 24m + 144$

**Simplify each expression using the proper operations. Show work!**

21.  $(3x - 5)(x + 2)$

22.  $2(x - 5) - 3(x^2 + 5x - 1)$

**Solve the system of equations using substitution.**

23.  $y = -x + 4$

$y = 7x - 4$

**Solve the system of equations using elimination.**

24.  $6x + y = -2$

$x + y = 3$

**Find the slope of the line that passes through the following points.**

25.  $(-1, 3)$  and  $(5, 9)$

26.  $(-1, -2)$  and  $(4, 5)$