Unit 4 Test Review

1. Write an equation in **factored form** for the function with the given zeros: $x = 5, -4, 1$

2. Write an equation in **standard form** for the function with the given zeros: $x = -3, 4$

Find <u>how many</u> zeros each polynomial has and list the end behavior for the following:

3. $f(x) = x^8 + 16x$

    a. Number of Zeros:

    b. Left End Behavior: $\lim\limits_{x \to -\infty} f(x) =$

    c. Right End Behavior: $\lim\limits_{x \to \infty} f(x) =$

4. $f(x) = x^5 - x^2 + 8x - 13$

    a. Number of Zeros:

    b. Left End Behavior: $\lim\limits_{x \to -\infty} f(x) =$

    c. Right End Behavior: $\lim\limits_{x \to \infty} f(x) =$

5. $f(x) = -x^3 - 45$

    a. Number of Zeros:

    b. Left End Behavior:

    c. Right End Behavior:

6. $f(x) = -x^6 - 13x + 7$

    a. Number of Zeros:

    b. Left End Behavior:

    c. Right End Behavior:

List the zeros of each polynomial. State the multiplicity of each zero and determine whether the graph crosses or touches the x-axis at the corresponding x-intercept. Sketch a graph of the polynomial.

7. $f(x) = x^4(x-1)(x+8)$

Zero	Multiplicity	Touch/Cross

$\lim\limits_{x \to -\infty} f(x) =$

$\lim\limits_{x \to \infty} f(x) =$
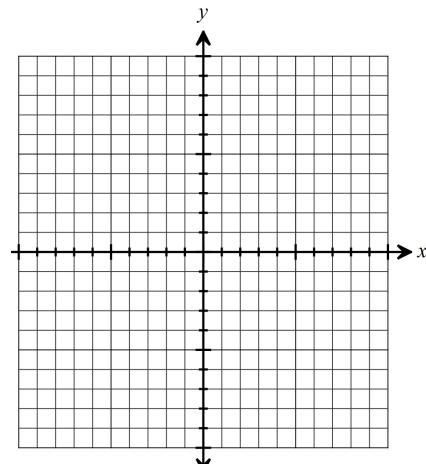
8. $f(x) = (x-2)^3(x+6)^3(x-10)$

Zero	Multiplicity	Touch/Cross

$\lim\limits_{x \to -\infty} f(x) =$

$\lim\limits_{x \to \infty} f(x) =$
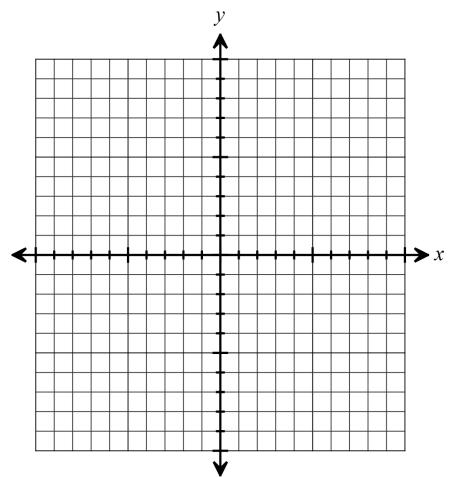
Find the zeros of the function by factoring or using the quadratic formula.

9. $f(x) = x^2 - 49$

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

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

12. $f(x) = x^2 + 16$

13. $f(x) = x^2 - 10x + 34$

14. $f(x) = x(2x - 3)(x + 5)$

Without using a graphing calculator, sketch the graph each function below. Identify the zeros, multiplicity, and whether the graph touches or crosses the x-axis. Determine the end behavior.

15. $f(x)=(x-4)^5(x+5)^2(x-7)$
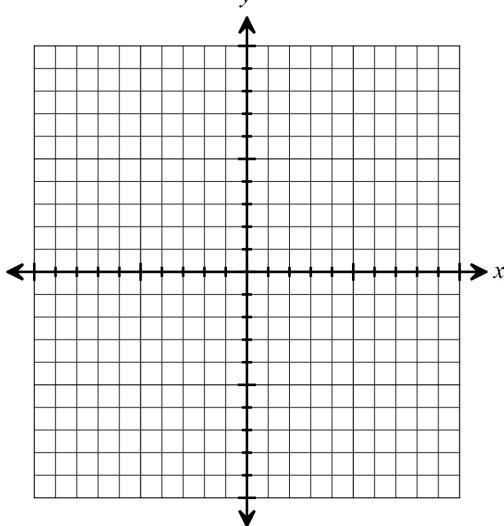
Zero	Multiplicity	Touch/Cross

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

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

16. $f(x)=x^3-64x$
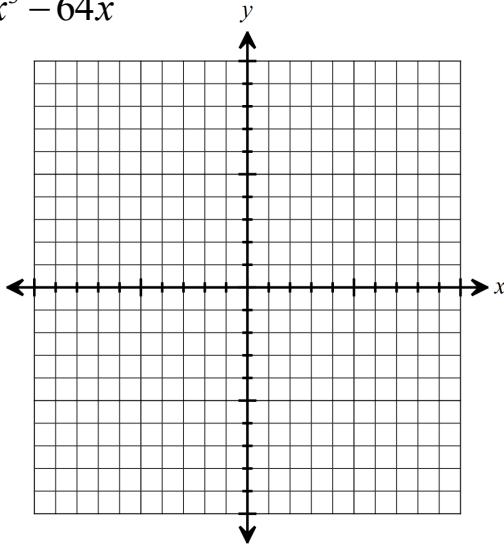
Zero	Multiplicity	Touch/Cross

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

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

17. $f(x) = -x^2 - 13x - 36$

Zero	Multiplicity	Touch/Cross

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

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